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OCTOBER 10, 1955

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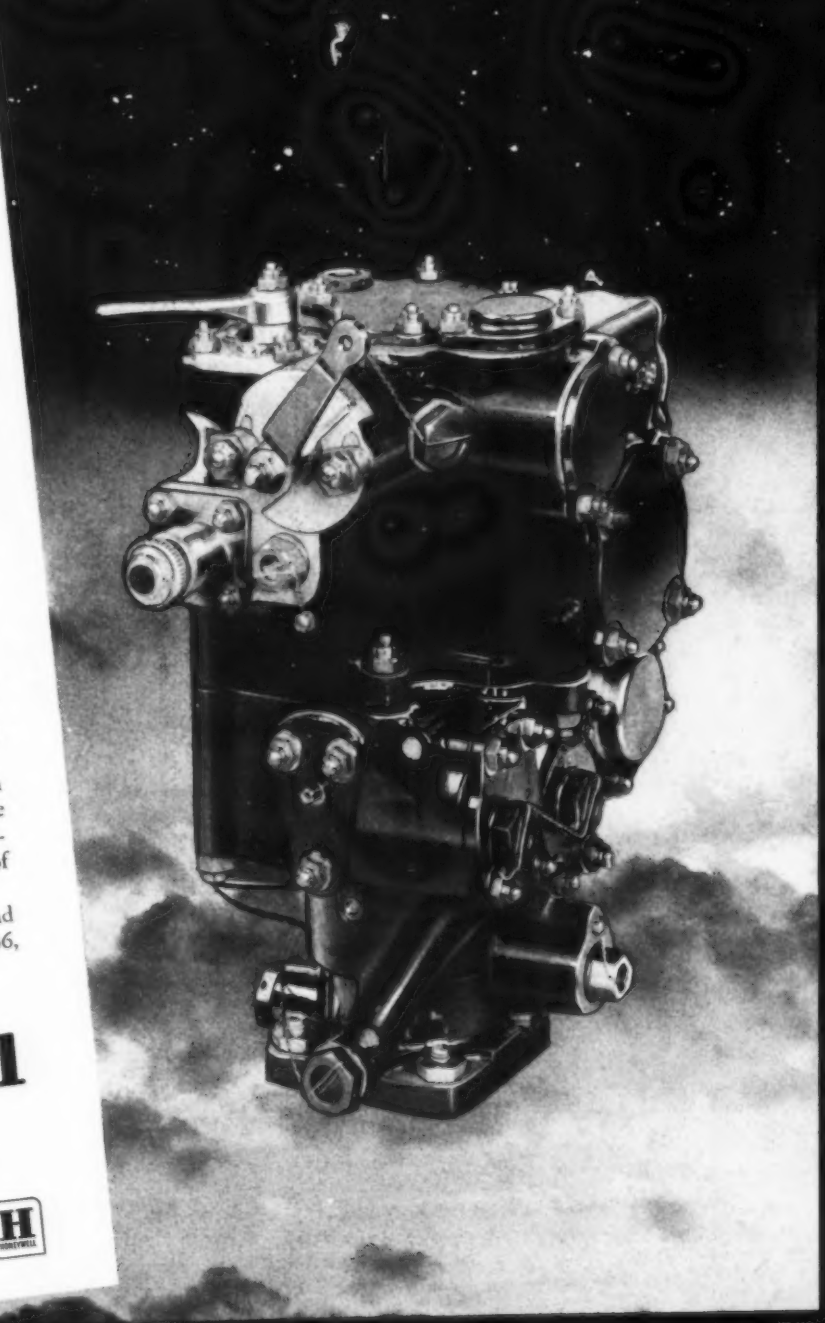

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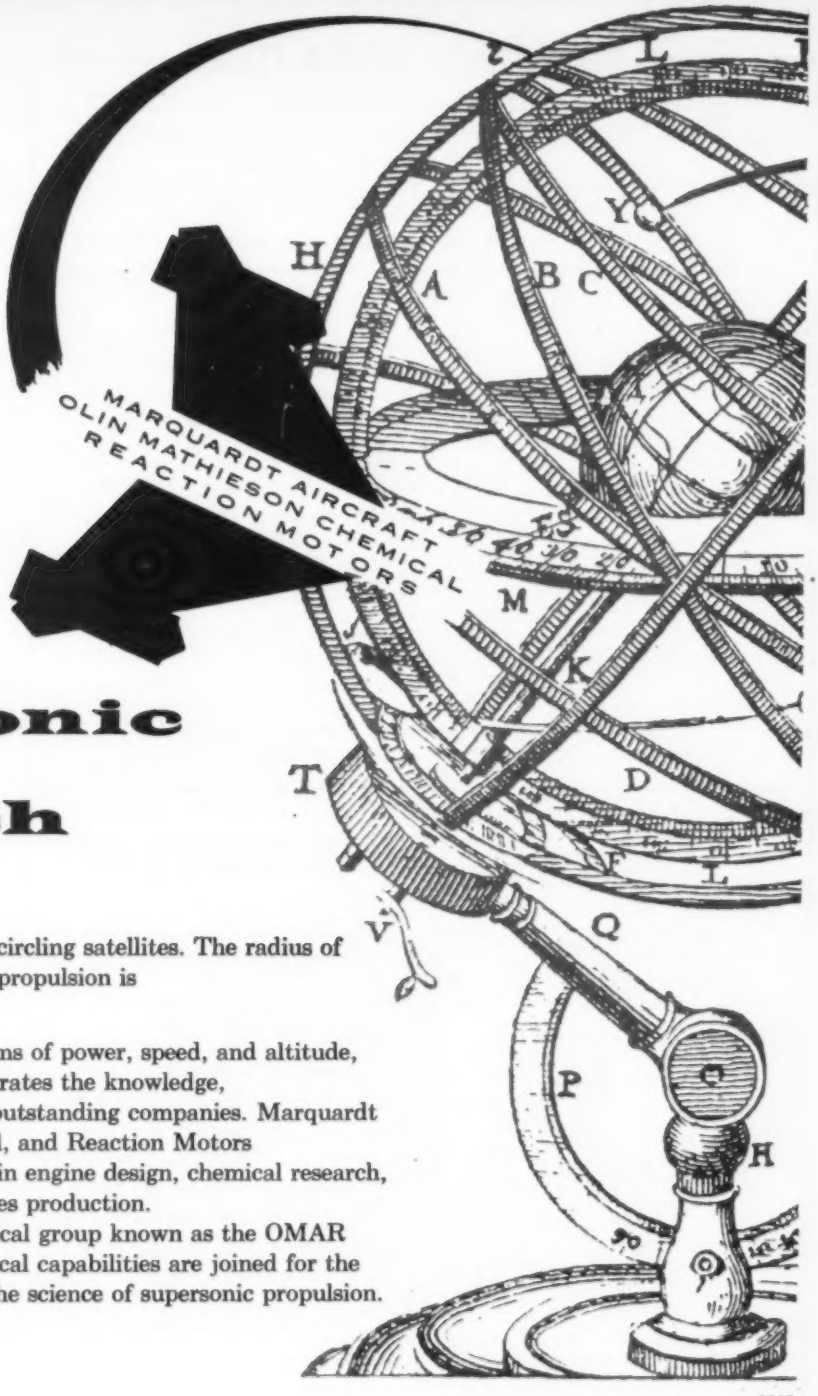
new orbit for supersonic research



Aircraft . . . missiles . . . now earth-circling satellites. The radius of research in the field of supersonic propulsion is constantly being lengthened.

Spearheading an attack on problems of power, speed, and altitude, a unique new research group integrates the knowledge, experience, and facilities of three outstanding companies. Marquardt Aircraft, Olin Mathieson Chemical, and Reaction Motors bring together leading authorities in engine design, chemical research, metallurgy, chemical and explosives production. Now coordinated through a technical group known as the OMAR Committee, chemical and mechanical capabilities are joined for the first time to add new impetus to the science of supersonic propulsion.

3360

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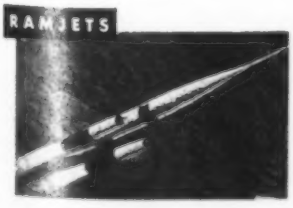
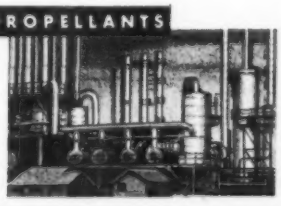


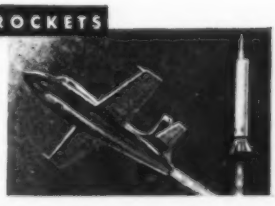
Marquardt Aircraft Company

PROPELLANTS



Olin Mathieson Chemical Corporation

ROCKETS



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new Boeing jet tanker to stretch America's Air Arm with mid-air refueling

Almost daily, continuous flights halfway around the World are being made because huge KC-97 tankers meet bombers for refueling in mid-air. Tankers like the Boeing KC-135 will bring "targets" on faraway Continents within striking distance. The new Boeing KC-135 will haul extra large cargoes because *added strength* with *less weight* is possible with metal honeycomb construction. Kawneer is helping build more planes like the KC-135 *faster* because of excellent metal bonding facilities to produce any kind of honeycomb assembly. Our experience in metal bonding honeycomb will be helpful to you in designing new applications of this material. This is another example of how you can benefit by Kawneer's integrated engineering and manufacturing service.

Kawneer will produce the ailerons for the KC-135 utilizing honeycomb sandwich construction

Illustrated here is the Boeing 707 Tanker-Transport prototype of the new KC-135.

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Industry News Digest

MATS Head Calls ATC System Obsolete

Civil Aeronautics Administration's present air traffic control system is not only inadequate and obsolete, but is completely unacceptable to our economy, society and national defense, according to Military Air Transport Service commander, Lt. Gen. Joseph Smith.

Addressing the Radio Technical Commission for Aeronautics in Washington recently, Smith said the only substitute that will bring orderly and prompt traffic movement is a system for positive control of all air traffic under all weather conditions.

The MATS head told RTCA it is unrealistic to expect the current CAA system to take on such a burden, but there is no alternative. Its evolution must start at higher altitudes and at lower levels of dense traffic.

• **Most urgent ATC need** in the Air Force today, according to Smith, exists above 20,000 feet. "Not only is there little control provided at these altitudes," he charged. "but where it is provided, it is sadly deficient."

Smith said it has been about a year since the USAF has made known its definitive requirements for high altitude control. Of reports that lack of funds have delayed the program, he warned: "The cost of a mid-air collision between one of our B-47s and a passenger-laden Super Connie could buy a lot of high altitude control."

Smith feels two things are needed to achieve solution of the ATC problem: first, more funds, and second, appreciation by all aviation interests that it will take a lot of money. "We are not going to get progress by waiting for the ultimate system," he cautioned RTCA. "Interim systems will cost dollars but will bring progress." • • •

ODM Sets New Goal For CRAF: 900 Planes

Office of Defense Mobilization has set a new goal of 900 commercial airline transports against which rapid tax writeoffs may be applied in building the nation's war-emergency Civil Reserve Air Fleet (CRAF).

ODM 900-plane target represents a 50% increase over its previous figure of 600 planes and applies to firm orders for new transports placed by December 31, 1955.

Latest extension, however, still falls short of the "open end" requirement which the airlines feel exists for more CRAF aircraft in their fleets. According to the Air Transport Association, carriers have already asked fast-writeoff for more than 300 planes since the 600-plane goal was reached.

In recent correspondence with Commerce Secretary Weeks, ATA pointed out that military needs for CRAF planes have been substantially increased since the first (300-plane) goal was set. ATA contends that, in event of war, the military would take over 300 or more airline aircraft and cause a definite shortage in meeting domestic defense and vital air travel requirements.

Pan American To Install IBM Electronic System

The first large-scale electronic data-processing system in the air transport industry, the IBM 705 system, will be installed by Pan American Airways for revenue accounting, crew scheduling, inventory control and payroll accounting. The unit rents for $30,000 per month.

The machines will be the fifth of their type in use in all of industry, and a 14-man Pan American team is now planning the final stages of the switch-over, scheduled for early 1956.

According to J. S. Woodbridge, Pan American Comptroller: "The airline business has grown so much in recent years that we have reached the saturation point with our present accounting machinery.

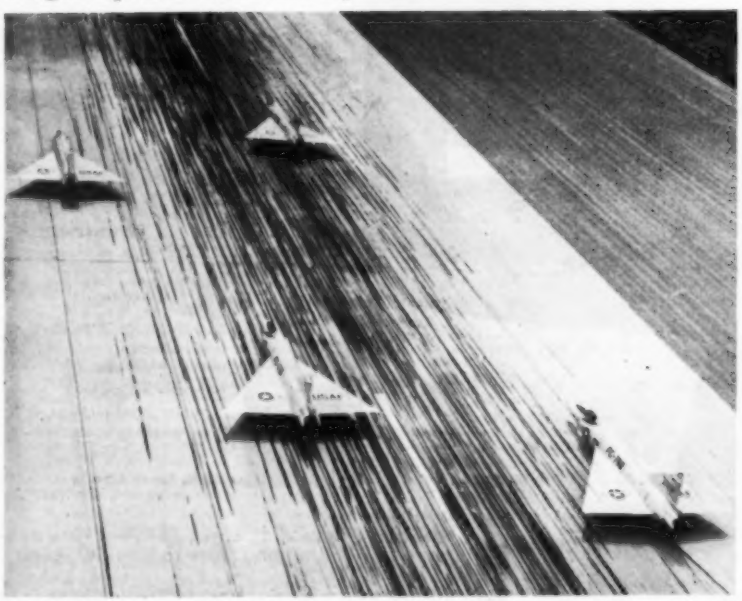
"One accounting procedure which now takes 750 machine hours will be completed in 15 hours by the IBM 705. We will be in a position to mine our records for information that it has never before been economically feasible to obtain."

Bell 47J Helicopter To Start CAA Tests

Tests leading to CAA certification for Bell Aircraft Corporation's Model 47J helicopter will soon get under way, J. Robert Duppstadt, experimental project engineer at the company's Texas division, told the American Helicopter Society at a forum in Los Angeles.

A four-place craft, compared to three for previous models, the latest of the Bell Model 47 series provides for a single pilot forward and a rear seat for three. With seat folded, it can carry up to 600 pounds of cargo. Gross weight of the 47J is 2,565 pounds, as compared with 2,350 for the 47G. It is powered by Lycoming's VO-435-21 engine.

High-Speed Illusion by Four F-102As



These four Convair F-102A delta-wing interceptors actually are preparing to take off at Palmdale, Calif., but the numerous tire streaks makes it appear they are speeding down the runway. F-102A has the NACA-developed pinched fuselage for supersonic speeds.

Cruising speed of the newest Bell helicopter is 80 knots at sea level. Range, with reserve, is 138 nautical miles. Main rotor blades are all metal, two feet larger than that of the 47G.

Loening Sees Flying Aircraft Carrier

Pentagon officials pondering the role of supersonic carrier-based aircraft 10 or 20 years from now have been given a new vehicle to think about—a flying aircraft carrier.

As a result of recent studies, well-known aviation consultant Grover Loening not only thinks such a development is feasible, but that we had better get to work on it, since a potential enemy could easily be doing the same thing.

Project proposed by Loening is a jet-powered, 20-engine flying boat that would gross 2.2 million pounds and cost $110 million, as compared with $160 million for a present-day Forrestal surface carrier.

By the time development could get under way, he feels, jet engines of 22,000 lbs. thrust would be available, giving the "flying carrier" a high performance thrust of 440,000 lbs.—one fifth its total gross.

• **Plan would be** for the carrier to house twenty 12,000-lb. supersonic fighters or 40 to 50 smaller (5,000 lbs.) types and to launch and land them along the 300-ft. top deck of the flying boat while both the fighter and carrier are cruising at about 400 mph.

A twin rudder arrangement providing an 80-foot span between the two rudders would offer a clear approach to the stern. Wings, aided by both low-drag and high-lift boundary layer control, would have a total span of 360 feet, with wing chord measuring 80 feet at base and 40 feet at the tips.

Range based on an 800,000-lb. fuel load, 400 mph cruising speed and 0.85 specific fuel consumption would be 4,000 miles. Estimated weights would be as follows:

Empty Weight	800,000 lbs.
Aircraft Housed	240,000 lbs.
Extra crew, rations, 100 men at 500 pounds each	50,000 lbs.
Armament stores	50,000 lbs.
Spare parts/extra equipment	100,000 lbs.
Extra rocket fuel for five missions for 20 aircraft	160,000 lbs.
Fuel for carrier	800,000 lbs.
Total	2,200,000 lbs.

Air Force Orders F-101B, More F-101As

McDonnell Aircraft Corp. has received more than $330 million in Air Force orders for three versions of its supersonic F-101 Voodoo interceptor. New contract boosts McDonnell's backlog to an all-time high of $601,032,000.

Included in the order is an initial quantity of F-101B long-range interceptor fighters and increased numbers of F-101A long-range escort fighters and RF-101A photo reconnaissance fighters.

Lockheed's T-33 Wins New Distinction

Lockheed Aircraft Corp.'s T-33 jet trainer (above) set a new standard in jet aircraft reliability recently when it won the distinction of being the first peacetime-produced military plane approved for service without a military acceptance test flight on each aircraft. Air Force is now testing only one out of every four T-33s entering operational units and indicates the ratio may eventually be expanded to one-in-eight or higher. Lockheed has been in continuous T-33 production since 1947 and has built more than 4,000 of the jet trainers.

Viscounts To Enter N.Y.-Bermuda Service

U. S. airlines will face competition from the Vickers Viscount in a new area next month when British Overseas Airways inaugurates service with the turboprop between New York and Bermuda on November 12. BOAC will operate three flights weekly between New York and Trinidad via Bermuda, San Juan and Barbados. The Bermuda-Port of Spain sector will be operated by British West Indian Airways.

Latin Americans Buy Fairchild C-82s

Several Latin American airlines have bought Fairchild C-82 transports and others are negotiating to buy the twin-boom aircraft which were sold by the USAF early this year to various brokers and non-operating concerns.

Biggest C-82 purchaser to date is Transportes Aereos Nacional, a Brazilian airline, which has acquired 21 from Bankers Life Insurance Co. for all-cargo use. This means that at least 33 C-82s will soon be in operation in Brazil, since the Brazilian Air Force has bought 12 direct from the USAF and is currently having them modified and overhauled by Fairchild's Hagerstown, Md., plant.

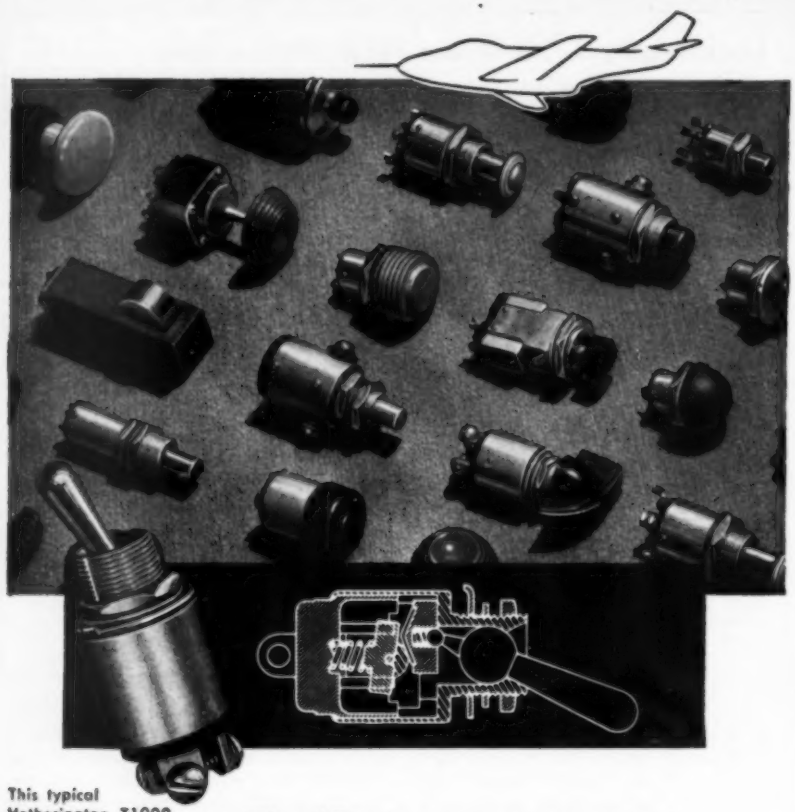
Wind Tunnel to Test High-Speed Missiles

Development of a hypersonic shock wind tunnel by the Cornell Aeronautical Laboratory, Inc., Buffalo, N. Y., has made it possible to test advanced type guided missiles, including the intercontinental variety, for heat tolerance at speeds of 10,000 miles per hour and more.

The tunnel can briefly generate speeds many times that of sound and temperatures higher than three times those of the surface of the sun (5,800° C.). Conventional wind tunnels have hitherto been inadequate for accurate testing of guided missiles, according to Cornell Labs' Abraham Hertzberg, who has been studying hypersonics since 1946.

CAB Extends Mail Test

Civil Aeronautics Board late last month extended the special rates for 3¢ mail by air experiments pending completion of a proceeding aimed at making them permanent. The experimental rates would have expired on September 30. They apply to 3¢ air mail trials between Chicago and New York/Washington, and between these cities and points in Florida.



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Letters

Re MATS' Function

To the Editor:

I wish to compliment you on your editorial on military airlift in the August 29 issue of AMERICAN AVIATION. I believe, like you, that the situation is deplorable, but until MATS' "Charter" is changed to make its primary function "transportation" (and on a pay-as-you-go) basis instead of "training," I can't see how we'll have much improvement. However, I believe the public is being mislead by criticism of the actual (and fancied) operation of LOGAIR by the Air Materiel Command.

LOGAIR is not a military airlift. Like the Navy's "Quicktrans," it is a commercial venture providing a contract airlift with civilian crews and ground personnel. It provides a service not available from any schedule airline, and was organized expressly for the purpose of obtaining maximum domestic cargo airlift at minimum cost. AMC accepted the fact that a comparable military lift might be more costly, and would compete with commercially available transportation. Thus, rather than criticize AMC for establishing LOGAIR, I feel that it should be commended for taking the lead in making use of commercial facilities.

It's too bad that publicity released by the Hoover Commission contained statements based on a month's sampling of the LOGAIR operation, but taken out of context in an obvious attempt to show conditions far worse than they are. Instead of "office forms, stationery, blanks, etc.," "blank forms, publications and drawings" were carried, and I understand that the bulk of this classification consisted of Tech Orders, without which no self-respecting Air Force can hope to operate.

Instead of "religious goods," it was "chaplain's equipment and supplies," but why make an issue out of eleven-thousandths of one percent of the total lift?

The same sort of analysis can be made for the rest of the items singled out. The sum total of these items amounted to but three-tenths of one percent of the total lift. Let's give them credit for doing a job instead of criticizing them for carrying an infinitesimal amount of space available cargo.

Let's face it. We have a commercial lift tailored to fit the requirements of the military. The planes are former military aircraft, to be sure, but what airline will say that it doesn't have any former military transports in its stable? The lift is as efficient as red tape can allow it to be, and the personnel involved are honestly dedicated to improving that performance. This operation provides an effective service hitherto unknown in the military. Let's give them a glad hand and hope they DO expand rather than beat down AMC's attempt to implement something we have all been ballyhooing for.

C. J. EGGSTAFF

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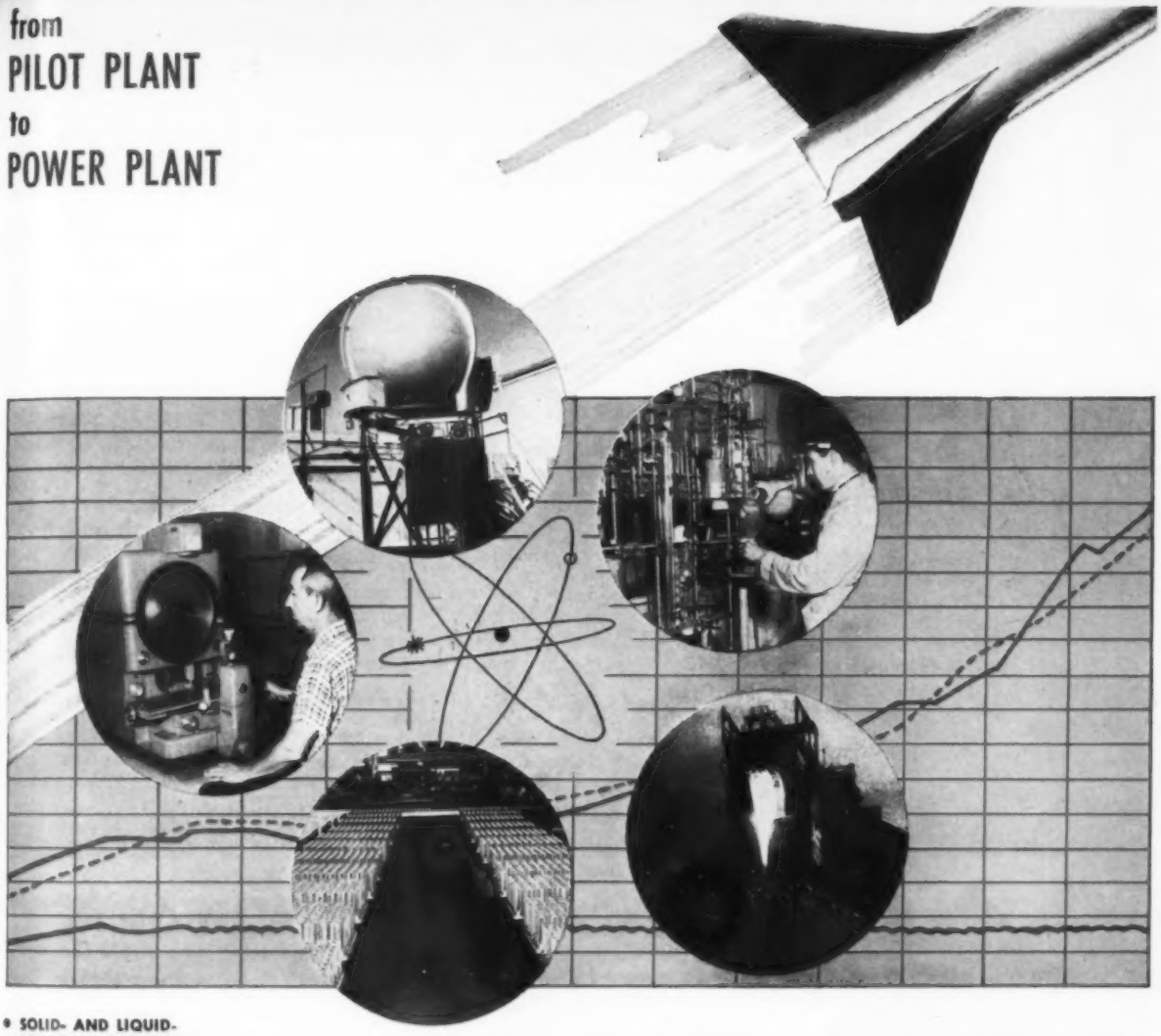

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There are no short cuts to certainty. Aerojet uses all the techniques of modern quality programs — new-design control, acceptance sampling plans, statistical analysis, quality auditing. In actual test-firings of complete rocket systems, Aerojet has spent over six million man-hours since 1942.

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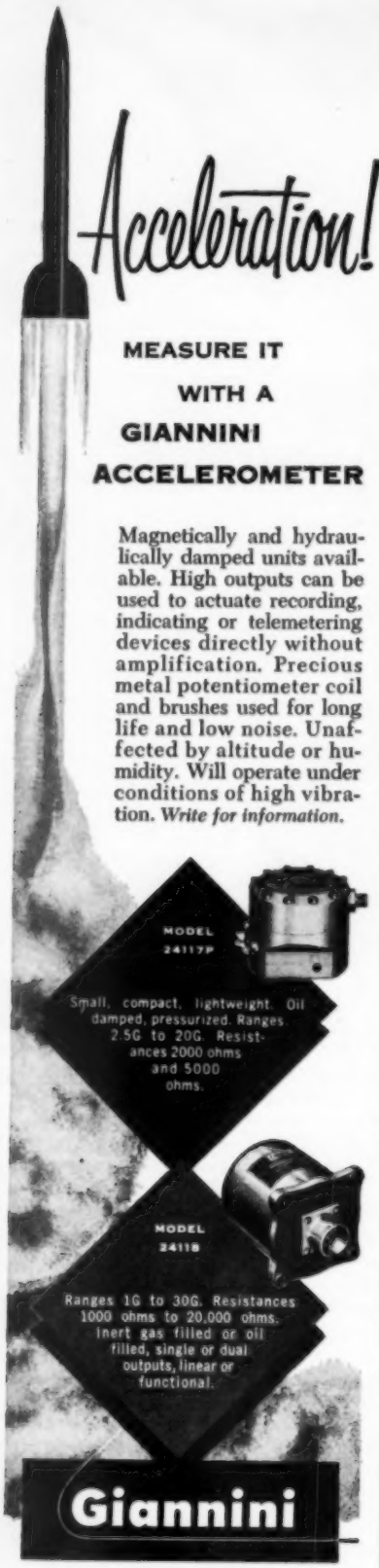
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Production Spotlight

• First two Republic F-105 fighter-bombers will be powered by Pratt & Whitney J57-25 turbojets, but production models will take the P&W 15,000-lb.-thrust J75. Plane originally was slated to take the Allison J71. Initial flight of the prototype is due about the middle of this month.

• Bell Aircraft's reconnaissance bomber is scheduled to be powered by two Pratt & Whitney J75s.

• Glenn L. Martin Co. has begun cutting metal on its Model 294, the company's own version of the B-57A, which is being built under license from English Electric. The 294 is not the plane for which Martin has a new Air Force design contract.

• Republic's turbojet-ramjet F-103 still is on paper.

• Fiat's first turbojet of its own design, the Model 4002 550-lb. thrust engine with a centrifugal compressor, was unveiled late last month.

• Piasecki Helicopter Corp. will set up a European sales and service organization soon, and will license production of the H-21 to a French or German company.

• Beech Aircraft Corp. has delivered the 8,157th in its Model 18 series. The plane was the 100th Super 18 delivered. Super 18 is powered by a pair of Pratt & Whitney 450 hp. engines. Top speed is 234 mph, with cruise 215 mph at 66.7% power. This version has a 3,290-lb. useful load.

• Spain's Casa 207 Azor twin-engine transport made its first flight Sept. 28.

• Continental Aviation & Engineering Corp. is in production of J69 and TC104 jet engines at its new Toledo plant, recently taken over from Air Force. First engines came off the line Sept. 16. J69 powers the Ryan Q2 Firebee and the TC104 is used in MA-1 portable jet starter.

• First flight of the Douglas DC-7C is expected within a month. Plane is considerably ahead of schedule.

• Watch for Navy to try for a new speed record with its Chance Vought XF8U-1, which is billed as "the world's fastest Navy fighter." Air Force now holds the record with North American Aviation F-100C mark of 822-plus mph.

• Large-scale production of the Hurel-Dubois HD 32 "DC-3 replacement" seems unlikely. SNCASE, which holds production rights, reportedly will not start a line unless it gets firm orders for at least 15 planes. Meanwhile, the H-D plant at Villacoublay is capable of taking care of small orders, although the planes are virtually hand-built.

• An engine for ultralight aircraft has been developed by the Coventry Victor Motor Co. Ltd., Coventry, England. Known as the Flying Neptune, the 1,815 cc four-cylinder (horizontally-opposed) engine develops 55 hp at 3,000 rpm engine weighs 210 lbs. Bore is 85 mm and stroke 80 mm.

• Scope of the present-day aircraft fire fighting problem with high fuel capacity bombers and transports is emphasized in a recent report by National Fire Protection Association of one of the largest aircraft fires on record. Incident involved an Air Force B-36 loaded with 29,400 gallons of avgas. Firefighters used 8,285 gallons of water, 18,000 pounds of carbon dioxide, 565 gallons of liquid foam and 3,200 pounds of dry powder foam before fire was extinguished.

• Inconsistencies between American and British aircraft parts' terminology proved responsible for Capital Airlines' only non-weather Viscount flight cancellation in 480 schedules to date. Following a starter failure at Chicago, inability of local mechanics to identify a spare labeled "electrical unit" forced complete cancellation of the flight.

• Sylvania's new laboratory at Waltham, Mass., is developing electronic systems for use in Convair's B-58 bomber.

• Italy's Macchi company has built a mock-up of its M.B. 326 Trainer. Engine of the tandem-seat aircraft is to be the Armstrong-Siddeley Viper initially; later a Bristol Orpheus may be used. The M.B. 326 will gross about 5,700 lbs. and will have endurance of over two hours.

Trans-Canada and Capital report remarkable traffic increases with Vickers VISCOUNTS

Wherever the Viscount flies... traffic figures rise! The latest dramatic proof of this statement is to be found in the recent records of Trans-Canada Air Lines and Capital Airlines.

TCA put Viscounts into service last April and increased traffic 22.5% over a major route in a five-month period. Capital inaugurated Viscount service on its Washington-Chicago route in July. Already they report that the Viscount is carrying more passengers *in both directions* than any other airliner.

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When & Where

Oct. 10-11—Defense Dept.-sponsored meetings on industrial mobilization planning between military and industry representatives, Los Angeles.

Oct. 11-13—Air Transport Association engineering & maintenance conference, Baker Hotel, Dallas, Tex.

Oct. 11-15—National Association of State Aviation Officials annual meeting, Dallas, Tex.

Oct. 11-15—Society of Automotive Engineers aeronautic meeting, aircraft engineering forum & aircraft production forum, Los Angeles.

Oct. 18-21—Air Transport Association purchasing committee meeting, Saxony Hotel, Miami Beach, Fla.

Oct. 20-21—Sixth annual National Noise Abatement Symposium, Armour Research Foundation, Chicago.

Oct. 25-27—American Institute of Electrical Engineers conference on aircraft electrical applications, Los Angeles.

Oct. 26—University Aviation Association annual meeting, Cleveland.

Oct. 26-28—National Aeronautic Association annual meeting, Cleveland.

Oct. 26-28—Southeastern Airport Managers' Association annual meeting, Greenville, S. C.

Oct. 27-28—Aircraft Electrical Society 12th annual display of aircraft electrical equipment, Pan-Pacific Auditorium, Los Angeles.

Oct. 31-Nov. 1—East Coast Conference on Aeronautical and Navigational Electronics, sponsored by I.R.E., Baltimore, Md.

Oct. 31-Nov. 2—Soc. of Automotive Engineers transportation meeting, St. Louis.

Nov. 1-3—Air Transport Association's Air Traffic Conference, San Francisco.

Nov. 2-3—Transport hydraulic conference, sponsored by Vickers, Inc., Detroit.

Nov. 3-4—TACAN symposium conducted by Air Navigation Development Board, Washington, D. C.

Nov. 7-9—Eastern Joint Computer Conference (IRE-AIEE-ACM), Hotel Statler, Boston.

Nov. 8-10—National Aviation Trades Association annual convention, Phoenix, Ariz.

Nov. 13-18—American Rocket Society-American Society of Mechanical Engineers joint meeting, Chicago.

Nov. 14-16—Aviation Distributors & Manufacturers Association 26th annual meeting, El Mirador Hotel, Palm Springs, Calif.

Nov. 21-22—Symposium on aeronautical communications sponsored by Institute of Radio Engineers, Hotel Utica, Utica, N. Y.

Nov. 28-30—Instrumentation Conference and Exhibit, sponsored by I.R.E., Atlanta Biltmore Hotel, Atlanta, Georgia.

Dec. 2-3—Eighth annual aviation conference & flight clinic, Tucson, Ariz.

Dec. 6-7—Professional Race Pilots' Association annual convention & business meeting, Carter Hotel, Cleveland.

Dec. 12-16—Nuclear Engineering & Science Congress, sponsored by Engineers Joint Council, Public Auditorium, Cleveland.

INTERNATIONAL

Oct. 10—IATA legal committee meeting, Nassau.

Oct. 11-12—Franco-Italian aeronautical meeting, Paris.

Oct. 13—IATA executive committee meeting, New York City.

Oct. 17-21—IATA eleventh annual general meeting, Waldorf-Astoria Hotel, New York City.

Oct. 21—IATA executive committee meeting, New York City.

Nov. 1—ICAO Pacific regional air navigation meeting, Manila.

Nov. 3-4—Institute of the Aeronautical Sciences-Canadian Aeronautical Institute joint meeting, Ottawa.

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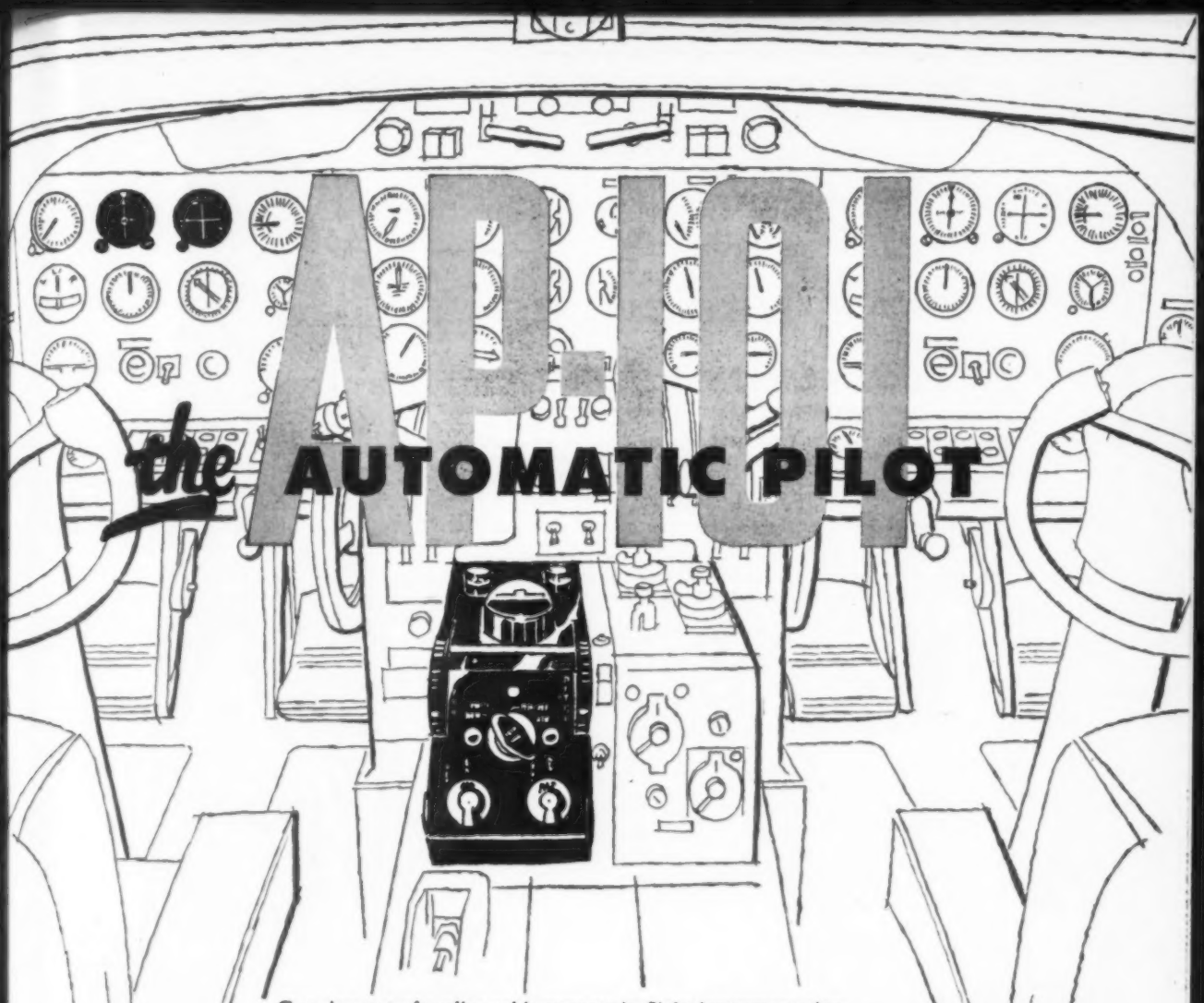
Circle No 8 on Reader Service Card. →



Growing out of earlier achievements in flight instrumentation, Collins Automatic Pilot System combines a proven flight director and dependable computer and servo units. The combined design technique offers weight and space economies along with these principal features: Pictorial presentation uses only two easy-to-read instruments to give complete monitoring of the automatic system . . . Smooth flight control assured by a special "fader" and precision hysteresis clutches . . . Greater reliability and negligible heat output attained through use of magnetic amplifiers and silicon transistors exclusively . . . Ease of maintenance provided through module plug-in type subassemblies in the computer and amplifier.

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The Hercules is in quantity production at Government Aircraft Plant No. 6, Marietta, Georgia, America's first turboprop production line for transports.

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Georgia Division, Marietta, Georgia

Personal View

By WAYNE W. PARRISH

How to Deceive the Public and Smear an Industry

WANT TO LEARN the trick of smearing an entire industry? Want to have the fun of making newspaper headlines and radio broadcasts and giving egghead columnists something to cry-in-alarm about?

It's quite simple. Step right up and take a short course of instruction from Senate Majority Leader Lyndon Johnson's Preparedness Investigation subcommittee.

The formula is simple. Take a set of high-sounding facts and figures, pervert them by using a phony basis for computation, hide the explanations in very small print, put the name of a respected Senator on the report, and shove it out to the press as though it reflected the truth.

Give the good Senator's staff full credit. For outright deception, the very slippery kind used either for desperate political or conniving ideological ends, the report carrying the Senator's name ranks among the smelliest of its kind. Not that recuperating Senator Johnson had the foggiest notion of what it was all about, since such work is done by staffs, but his name is on the report so he's responsible.

You know the report we mean, the one issued recently which said the aircraft industry profits are awfully high and need investigating. Wonderful headlines and news broadcasts. All designed to make the public think the aircraft builders are a bunch of robber barons.

But AMERICAN AVIATION has a very alert research department headed by the very alert Mr. Arthur Newfield. Like many others, Mr. Newfield read the news stories. He quickly obtained a copy of the printed report. Not being easy to fool, and possessing an eagle eye for facts, Mr. Newfield got more suspicious the more he read the report. It wasn't long before he discovered something very phony.

Phony is right. It's more than phony. It's an outright permutation of the facts. The Lyndon Johnson subcommittee is guilty of a pernicious bit of distortion designed to crucify the aircraft industry.

Why? Presumably in the name of politics. But is it politics alone? Has politics sunk so low that a Senate subcommittee staff would actually use a distorted, unfair, dishonest formula for computing company profits?

If you want to read all of the details, you'll find them in the lead article a few pages further along in this magazine. But in essence, what the committee staff did was to compute net profit after income taxes as a percentage of net worth by dividing the net profit transferred to surplus by the amount of net worth at the *beginning* of the period. This is what the committee says itself—in fine print and involved language. But the news writers and broadcasters skip over such details.

In other words, the committee took the profits at the *end of the year* and divided them into the net worth *at the beginning of the year* and, quite naturally, came out in many instances with startling results.

For any industry as fluctuating and fluid as the aircraft industry there is a much fairer method of determining the percentage of net profits to net worth. The net profit/net worth percentage should be determined by using the net worth at the end of the period—identical with the profit period.

What difference does it make? Plenty. Instead of a net profit/net worth percentage of 72.9% which the committee attributes to The Martin Company for 1954 (a figure which could well stand some eyebrow raising), the true figure is 42.6%. Quite a difference.

Another gross distortion was General Dynamics, which should have been 23.4% instead of 65.9% as reported by the committee.

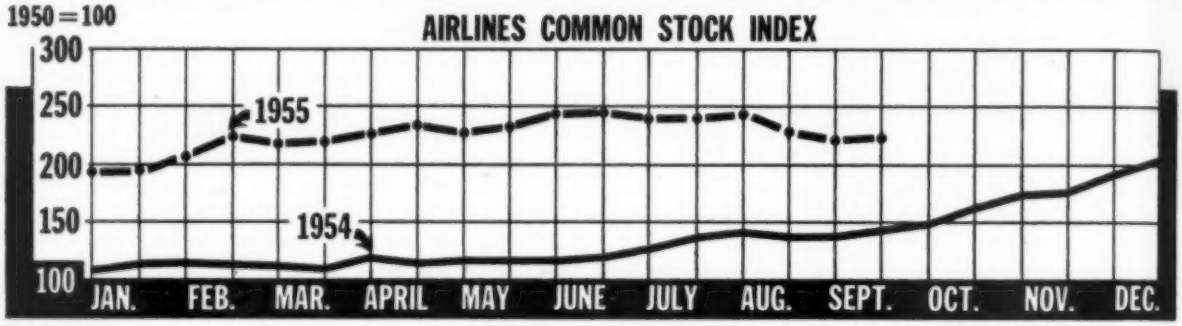
Only one or two companies were not affected by the committee's loaded-dice formula. *All of the remainder were permuted by one degree or another, and all on the unfavorable side.*

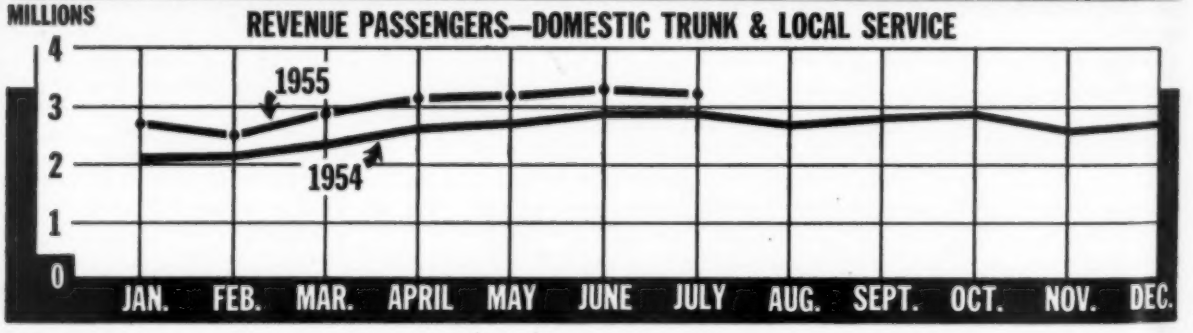
The aircraft industry operates in a fish bowl. It has nothing to hide or be ashamed of. It has a tremendous amount to be proud of. Before Senator Johnson lends his name to further investigation of the industry, perhaps he should first do a little snooping around his own committee. Something smells. Just *why* was there a nefarious attempt to delude the public and smear an industry? Just *why* was that dishonest basis used for computing profits? It *must* be more than just plain old American politics.

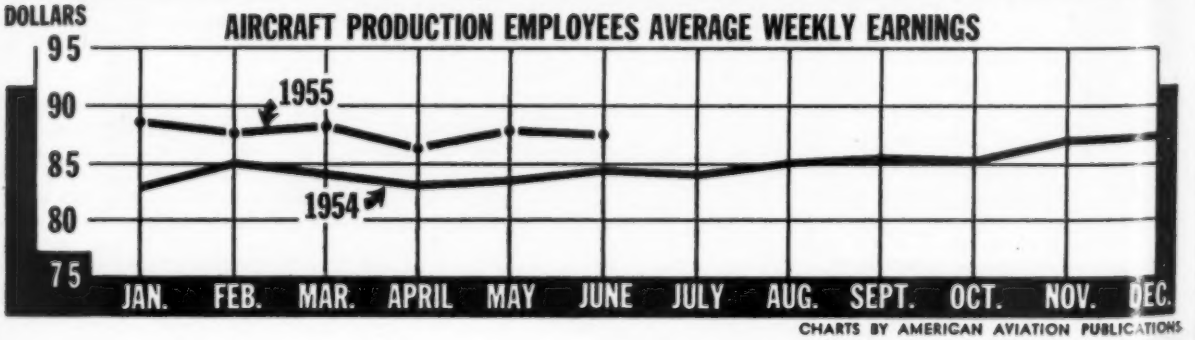
And before Representative F. Edward Hebert, the Louisiana Democrat, jumps into *his* forthcoming inquiry into aircraft "profits," let him first establish an honest, standard, fair basis for computing profits before crying to the heavens in the name of partisan politics that they're too large.

As for Senator Johnson, it's only too well-known that he is recuperating from a severe heart attack and hasn't been able to keep in touch with his many assignments. But his name is on the report. We're told good Texans don't welch, nor do they resort to loaded dice. So maybe the Senator can find out what's been going on in his name and get those loaded dice thrown out. If not, we have another suggestion ready and waiting.

Pulse of the Industry







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Circle No. 9 on Reader Service Card.

AIRTRENDS Washington, D. C., Oct. 10, 1955

IT'S DEFINITE NOW. THERE WILL BE NO REDUCTION in Defense Department spending during the current fiscal year (and especially for aircraft procurement) in an attempt to balance the budget.

Defense Secretary Wilson has passed the word to Treasury Secretary Humphrey that "after a very complete review" the Pentagon has concluded that it will have to spend $34.5 billion in fiscal 1956. That's half a billion more than had been anticipated when the 1956 budget was submitted last January.

Wilson points out that "it now looks as though it will be very difficult to get down to the $34-billion estimate," and cites increases of $285 million in expenditures not planned in January. One big chunk is accounted for by the $200 million in additional funds to step up production of the Boeing B-52, McDonnell F-101B and Lockheed F-104.

Despite the decision that there will be no major defense cuts for the sake of a balanced budget, Wilson has ruled out any additional funds this year for Air Force research and development activities. "I don't think we will have a supplemental for research and development," he said. "We're too close to (fiscal) 1957."

THE PRESIDENT'S HEART ATTACK may result in unexpected probing of the aircraft industry. Until Mr. Eisenhower suffered his coronary thrombosis, both political parties were pretty well convinced he would run again in 1956. But the doubts that are now raised are making many Democrats, who had no particular desire to be defeated in 1956, itch for the nomination.

Among the hopefuls: Missouri's Sen. Stuart Symington and possibly Texas' Sen. Lyndon B. Johnson.

Both men are members of the Senate's Preparedness Investigating Subcommittee and probably will lose no opportunity to get their names before the public between now and the Democratic convention in Chicago next summer. Since Symington (a former Air Force Secretary) and Johnson both are well versed in the airpower picture, they may well pinpoint their attacks on the Russian air threat and the U.S. aircraft industry's role in meeting it.

ALTHOUGH FINAL RECOMMENDATIONS of Air Navigation Development Board's special study of short-range navigation channel requirements remain administratively restricted, its government-industry Committee No. 3 reportedly settled on four types of facilities needed for total coverage. Included are a 200-mile enroute facility protected up to 75,000 feet out to 200 nautical miles; a 100-mile enroute facility with 18,000 ft./100-mile protection; a 30-mile enroute/terminal facility also with 18,000 ft./100-mile protection, and a precision approach facility up to 18,000 feet from the airport surface out to 30 nautical miles.

PIASECKI HELICOPTER CORP. plans to change its name to Vertiplane Corp. and the company directors have recommended two additions to the board: Thomas K. Finletter, former USAF Secretary, and John F. Floberg, former Assistant Secretary of Navy for Air. Name change results from fact the company founder, Frank Piasecki, has set up a new firm called Piasecki Aircraft Corp.

Another town is safer tonight because these trained civilian members of the Ground Observer Corps are scanning the skies to warn against possible enemy attack. But all over America there are many areas, perhaps your own, that do not have this protection because the G.O.C. is seriously understaffed.

In extending its vital work to all 48 states the Ground Observer Corps needs many thousands of new observers. You'll find the G.O.C. both interesting and exciting! A few hours a week of your spare time will help keep your home and country safe. Volunteer today...contact Civil Defense!

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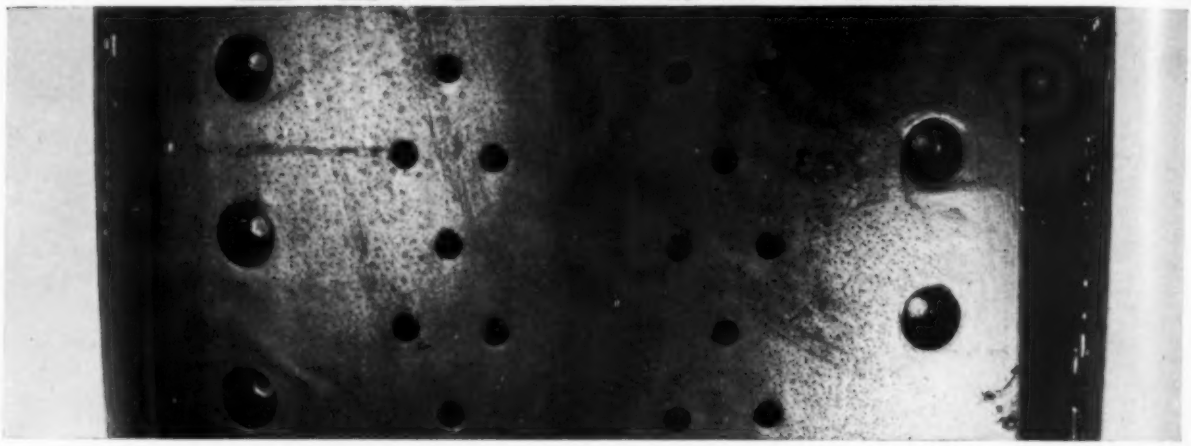
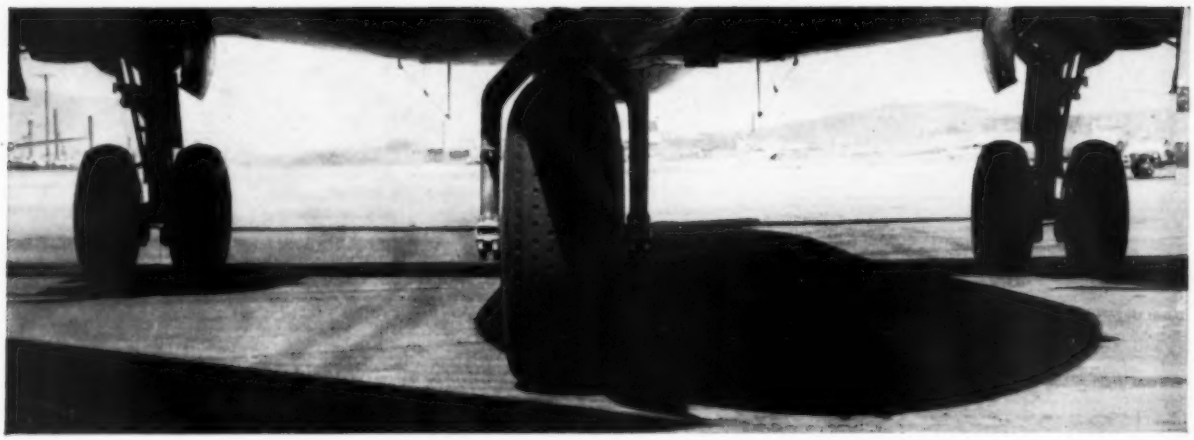
Through the assistance of the Ground Observer Corps, the U.S.A.F. Air Defense Command is prepared for any alert with aircraft such as the Convair-built F-102A all-weather supersonic interceptor.

RESEARCH KEEPS **B.F.Goodrich** FIRST IN RUBBER





New B. F. Goodrich tire is Dimpled for more landings, Tubeless for less weight

THE B. F. GOODRICH Dimpled Tubeless Tire combines the most advanced tread design with the most advanced tire construction. It reduces wear an average of 10%. By eliminating the tube, it reduces tube weight by as much as 75%.

The most recent comparison tests show that the B. F. Goodrich Dimpled tread outwears other leading brands by a substantial margin. Reasons? It is better protected against tread cutting because dimple-like indentations result in better tread load distribution. Wear is slower, more even. The tread also has a broader footprint so wear is spread more evenly from shoulder to shoulder. Result: more landings before recapping.

Furthermore, B. F. Goodrich Tubeless Tires make greater pay loads possible. On United's DC-6B, above, BFG Tubeless Tires reduce weight approximately 48 pounds under regular tires and tubes. These tires save time and money in warehousing and maintenance too. Instead of a tire and tube, there's only the tire to purchase and stock – only the tire to mount and service.

As in B. F. Goodrich Tubeless Tires for cars, added safety is achieved by eliminating the inner tube. There's no tube to chafe or leak. No tube to bunch or shift during take-offs or landings. A patented inner liner, built as an integral part of the tire itself, replaces the conventional tube and retains correct inflation pressure much longer.

The new Dimpled Tubeless Tire is another example of B. F. Goodrich leadership. *The B. F. Goodrich Company, Tire and Equipment Division, Aeronautical Sales, Akron, Ohio.*

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RESEARCH KEEPS B.F.Goodrich FIRST IN RUBBER

Circle No. 10 on Reader Service Card.

ESTABLISHED JUNE 1, 1937

World's Largest Aviation Publishers
American Aviation

VOL. 19, NO. 10

Senate Report Distorts Profits Picture

• Investigating subcommittee statistics exaggerate gains.
• Questionable computation methods put industry at disadvantage.

By ARTHUR J. NEWFIELD

PROSPECTS that the aircraft manufacturing industry would get a fair "shake" from Senate Majority Leader Lyndon Johnson's Preparedness Investigating subcommittee in its broad inquiry into the nation's airpower have taken a sudden turn for the worse. (see editorial, p. 15)

Analysis by AMERICAN AVIATION of that group's first effort, a so-called factual report on corporate profits and return on net worth of top producers for the past 13 years, shows it to be a far cry from just that.

Careful scrutiny of the document discloses many statistical findings of "fact" which overstate the profit of firms analyzed, obviously to the detriment of industry. In one instance involving statistics for General Dynamics Corp., use of what are considered irregular methods of computation results in a net profit/net worth figure 42.5% in excess of what more standard practices would yield.

True, the subcommittee emphasizes and re-emphasizes that no effort is made at this time to pass on the reasonableness of the profits. However, it is a foregone conclusion that any use of the data now or in the future will tend to place the industry in bad light.

• **Big area of misrepresentation** in the Johnson group's report lies in methods used to arrive at the profit picture. Techniques employed by its researchers in tabulating the net profit/net worth status of leading aircraft firms could have only one result—that of exaggerating the profit situation.

When queried by AMERICAN AVIATION as to the source of the statistics, subcommittee investigator Wallace Eagle disclosed that all basic financial data and statistics came from a special report prepared for the group by Charles Ray McCutcheon of the Securities and Exchange Commission.

• **It was also learned** that SEC was given a free hand by the subcommittee on how the profits data was to be presented. In no manner did the Johnson group set the "ground rules" or instruct the Commission on preparation and assembly of the vital statistics.

As a result, for some 18 aircraft producers represented, the Preparedness Investigation subcommittee arrives at a combined net profit/net worth per centage for 1954 of 30.6. What this is intended to mean is that for every $10 of net worth in 1954, industry realized a profit for the year of slightly over $3.

But what the report conceals in its fine print is that the final percentage arrived at was computed by dividing net profit at the *end* of the year by net worth at the *beginning* of the period. By completely disregarding industry's increase in net worth for a full 12-month period, the resulting percentage consistently becomes higher.

• **A more standard method** of computing the profit/worth percentage, one that would give manufacturers a fair and unbiased representation in the looming profits investigation, is to use both net profit and net worth at the end of the period being studied.

Had this more realistic approach

HOW SENATE REPORT CONFUSES AIRCRAFT PROFITS' PICTURE

Company	Net Worth 1953 ($000)	Net Worth 1954 ($000)	1954 Net Profit After Taxes ($000)	Net Profit/Net Worth Preparedness Subcommittee* (Percent)	Net Profit/Net Worth AMERICAN AVIATION** (Percent)
Beech	7,211	9,997	3,386	47.0	33.9
Bell	22,870	34,398	6,404	28.0	18.6
Boeing	82,194	109,441	36,976	45.0	33.8
Cessna	8,371	10,181	2,175	26.0	21.4
Chance Vought	17,362	23,139	6,640	38.2	28.7
Curtiss Wright	125,926	136,412	19,377	15.4	14.2
Douglas	98,604	120,891	36,157	36.7	29.9
Fairchild	23,316	31,531	4,134	17.7	13.1
General Dynamics	31,578[1]	88,730	20,795	65.9	23.4
Grumman	36,126	41,631	10,505	29.1	25.2
Lockheed	73,095	88,837	22,446	30.7	25.3
Martin	27,495	47,077	20,052	72.9	42.6
McDonnell	16,723[2]	17,931	3,621	21.7	20.2
Northrop	12,429	15,867	3,829	30.8	24.1
North American	65,062	77,795	22,180	34.1	28.5
Republic	25,703	32,250	8,977	34.9	27.8
Ryan	7,103	8,745	1,962	27.6	22.4
United	152,896	149,496	25,996	17.0	17.4
Combined Industry Totals	$834,064	$1,044,349	$255,612	30.6	24.5

* 1954 net profit after taxes divided by 1953 net worth.
** 1954 net profit after taxes divided by 1954 net worth.
(1) Subcommittee data omits Consolidated Vultee net worth. Should read $74,472,000.
(2) Subcommittee data obtained from McDonnell's 1953 annual report Figure is obsolete in view of two subsequent revisions, one in 1954 annual report to $15,535,000 and another in 1955 report to $14,841,000.
Sources: Net Worth—1953 data from first report of Preparedness Investigating subcommittee; 1954 data from annual reports of companies.
Net Profit—First report of Preparedness Investigating subcommittee.

been applied by the Johnson subcommittee, the combined industry net worth/net profit figure drops 6.1% to a total of 24.5% for 1954 (See table). Even wider variations between the committee's statistics and those derived from more standard methods are evident throughout the 1942-1954 period surveyed.

Best example of this is the profit/worth percentage shown for The Glenn L. Martin Co. for 1952. By using Martin's $564,000 reported net worth on January 1 of that year and its year-end net profit of $5,808,000, the subcommittee arrives at the astronomical profit/worth figure of 1,029.8%.

Had the group recognized the obvious shortcomings of its computation and used Martin's year-end net worth of $11,051,000, this percentage would become 52.6%—a 977.2% variation.

• **A similarly distorted view** is shown for General Dynamics' profit picture in 1954. By taking G-D's net profit as of December 31, 1954 of $20,795,000 and dividing it by its net worth on December 31, 1953, the Committee comes up with a healthy 65.9% profit/worth figure.

Proof of how irregular this practice is lies in the fact that the net worth figure for 1953 does not include the net worth of Consolidated Vultee, while the net profit figure does. Significance of this omission is that General Dynamics' final percentage would have been 27.9 instead of the 65.9% reported.

Furthermore, the January 1, 1953 net worth figure should not have been used in the first place. A conventional appraisal of the situation would dictate use of G-D's January 1, 1954 net worth of $88.7 million which includes assets of Consolidated Vultee and yields a net profit/net worth percentage of 23.4.

• **In virtually every instance** (in the case of 17 out of 18 companies during 1954), by applying past year's net worth to current net profit, the subcommittee has effectively exaggerated the industry profits situation.

What immediate application will be made of these "distorted" figures remains to be seen, but it is a good bet they will play an important role in future policy of the parent Senate Armed Service Committee toward Defense procurement.

• **Reason is that** the Preparedness Investigating subcommittee roster list top names in both Democratic and Republican ranks. In addition to Johnson, Democrats include former AF Secretary Sen. Stuart Symington (Mo.), Sen. Estes Kefauver (Tenn.) and John Stennis (Miss.).

On the Republican side are Sens. Styles Bridges (N.H.), Leverett Saltonstall (Mass.) and Ralph E. Flanders (Vt.).

Before the Johnson subcommittee reaches a stage of decision, and before the repercussions of its first report become too widespread, industry can only hope that a more realistic presentation of the profits picture will find its way into subcommittee's files. • • •

Glass Resigns, Wiley Named PNYA Air Chief

GLASS WILEY

The resignation of Fred M. Glass as director of aviation of the Port of New York Authority and appointment of John R. Wiley as his successor recently was announced by David V. Lowe, PNYA chairman, effective October 15.

Glass, 42, has held the post since 1949 and resigned to accept an executive position in private industry. His new assignment, to be announced shortly, is understood not to be in aviation.

Prior to joining the Port Authority, Glass was chief attorney in the U.S. Bureau of Commerce and chief attorney-examiner of the Air Safety Board of CAB. He also has served as vice president-traffic of Capital Airlines and president of Air Cargo, Inc.

Wiley has been deputy director of the aviation department since March 1950, before which he was director of American Airlines' Planning and Controls Division. Also, while with American Airlines he was director of the inventory Control Division of the Materials Department and, earlier, assistant manager of air mail and express.

Taking over as deputy is Marshall D. Kochman who has been chief of the PNYA Air Terminal Properties Division since January, 1952.

Sports Pilot Dies

Benjamin King, 67, who set eight lightplane altitude, speed and distance records in the mid 1930s, died in Washington, D. C., Sept. 29. He was a member of the Quiet Birdmen.

Grumman S2F-2 Navy Sub-Killer

NEWEST NAVY SUB-KILLER is this Grumman S2F-2, designed to carry a "new, larger, classified" anti-submarine weapon. Note enlarged torpedo bay and Fiberglas "tear drop" antenna housing above cockpit. These were not on earlier S2F-1. The sub-killer carries a crew of four.

Who's to Blame for Shortcomings of F3H-1?

McDonnell, Westinghouse, Navy All Deny Responsibility

The Navy had a "demon" of a situation on its hands last week.

Source of the Bureau of Aeronautics' difficulties was the McDonnell F3H-1 Demon carrier jet fighter, of which 60 had been delivered between December 1953 and June 1955. Complicating the matter was the Westinghouse J40 engine, which apparently never developed enough power to enable the plane to perform its mission.

As a result of this situation, the Navy had told Westinghouse to stop further development of the J40 in mid-1953. But the 150 F3H-1 aircraft scheduled to be built under a contract awarded in 1952 were changed to an order for 60 and the remainder were switched over to the F3H-2N configuration, which uses the Allison J71 as a substitute power plant.

• **The Navy** has now taken over all 60, but 29 are back at McDonnell's St. Louis plant so they can be backfitted with the J71. Twenty-one others, considered unsuitable for Navy carrier operations but deemed not worth converting because of the high cost, are scheduled to be employed for armament research, mechanic training and similar non-combat purposes. Of the remaining 10, six have crashed and the four others became prototypes of the F3H-2N.

Inability of the 21 Demons, which cost an estimated $28,350,000 to acquire, to serve in a combat role has touched off a scheduled "preliminary" investigation by the House Military Operations subcommittee (headed by Rep. Chet Holifield, D., Calif.) and the likelihood of a second by the Senate Military Preparedness subcommittee (headed by Sen. Lyndon B. Johnson) to determine who was at fault. It seemed last week that everyone concerned was passing the blame to someone else.

• **Westinghouse Electric Corp.** contended it had delivered the engine the Navy ordered and that if the power proved inadequate, the Navy presumably was at fault.

• **McDonnell Aircraft Corp.** maintained that it had simply built the airframe, intimating that any troubles with the engine's lack of adequate thrust could certainly not be attributed to its engineering.

• **Navy Secretary Charles S. Thomas** declared that the aircraft involved were ordered in 1951 (when the Democratic Administration was in power) "under procurement procedures now considered inadequate." Just two days before Thomas' statement, however, the Navy said that it was discovered the power of the J40 was inadequate for the weight of the F3H-1 after the first few models underwent suitability tests at Patuxent River, Md., i.e., after December 1953 (when the Republicans had taken over) and but that it had continued to buy J40-powered Demons through June 1955.

• **Defense Secretary Charles E. Wilson** indicated that none of the parties concerned could really be blamed. He said that whenever a crash program starts and several new airplane models are rushed into production, "you occasionally get a sour one."

Actually, however, the F3H-1 situation was not an isolated case and Westinghouse was not the only engine builder which had had development troubles.

The J40, in addition to the Demon, had been scheduled to be the power plant for several other Navy aircraft, including the Douglas A3D and F4D and the Grumman F10F. But principally because of J40 difficulties, the F10F was canceled completely and Douglas modified its two aircraft to take competitive USAF-sponsored engines, the Allison J71 for the A3D and the Pratt & Whitney J57 for the F4D.

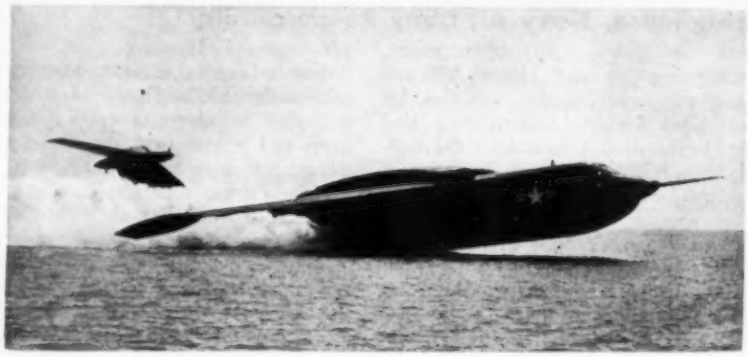
• **Westinghouse's smaller J46,** which also had plenty of teething troubles, was one of the major reasons the Navy last year cut back orders for the Chance Vought F7U-3 and eliminated CVA's A2U-1 attack plane completely. Delays in the J46 program were also important factors why Convair's XF2Y-1 Sea Dart flying boat never evolved into a production airplane and why the experimental Douglas X-3 will probably never come anywhere near the Mach 3 speeds for which it was designed. (Smaller Westinghouse J34s were substituted for J46s in the X-3.)

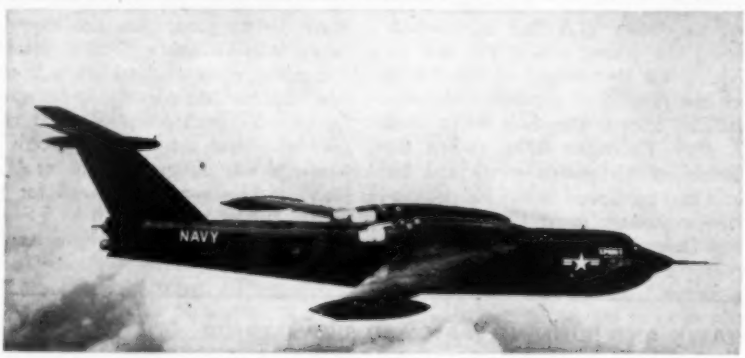
Other engines which have resulted

MIDGET A4D SKYHAWK AND RUNNING MATE A3D SKYWARRIOR

Navy's midget Douglas A4D Skyhawk looks even smaller standing alongside its running mate the Douglas A3D Skywarrior. A4D is powered by a Wright J65 turbojet and the Skywarrior by a pair of Pratt & Whitney J57s. Skyhawk is U.S.'s smallest and lightest bomber.

SeaMaster Starts Flight Test Program





Navy's first multi-jet seaplane, the Martin XP6M-1 SeaMaster, is undergoing flight tests, already has logged more than 25 hours. The SeaMaster was airborne one hour and 40 minutes on its first flight last summer. Pictures have just been released. The XP6M-1 is powered by four Allison J71 turbojets, is in the 600-mph class and has a design cruising altitude of 40,000 feet.

in cancellations of airframe orders or delayed deliveries (or in some case where no orders were forthcoming despite expectations by the airframe company) include Curtiss-Wright's J65 and J67 and Allison's T40 turboprop and J71 turbojet.

Wright's J65, power plant for the Republic F-84F, was not delivered in time to coincide with Republic's production schedule and last year scores of Thunderstreaks were stacked up at Republic's Farmingdale, L. I., facility until engines were delivered. The situation also resulted in a stretch-out of deliveries of the F-84F and RF-84F but no orders were canceled.

The 15,000-pound-thrust Wright J67 was slated to be the engine for the Convair F-102B delta interceptor but because of delays the USAF has substituted P&W's J75 instead.

• In the case of the Allison T40, the Convair R3Y-1 Tradewind flying boat never developed into the large-scale production article the San Diego firm had expected and gear box troubles with the T40 have been cited as one principal reason.

As far as the J71 is concerned, the Navy used development difficulties with the Allison turbojet as one of the more important reasons for cutting back on F3H-2 orders last year.

The situation at the moment focuses on the J40 and the Demon. But few aviation insiders would be surprised if House and Senate investigators start probing other planes and other engines and the losses resulting from subsequent cancellations and/or required airframe modifications to take substitute engines.

Army Plans to Be Air-Transportable, Says Gen. Taylor

The Army is determined to become air-transportable in terms of both personnel and materiel so that it can strike back quickly and with maximum effectiveness at any aggressor nation no matter where he attacks, Gen. Maxwell D. Taylor, Army Chief of Staff, says.

"Because of the critical need to react rapidly," said the Army Chief of Staff, "the Army is constantly thinking in terms of air-transport, and the use of strategic air fleets which can pick up our soldiers and move them promptly to any area."

Korea was relatively easy for the U. S. to reinforce from Japan, Gen. Taylor pointed out, but "the next time the aggressor might not pick such a convenient location."

As a consequence of this thinking, Gen. Taylor said, "Not only does the Army intend to become air-transportable to do its job but we expect to become an atomic army, equipped with weapons of great power, and transportable by air."

"The day has passed," he continued, "when the atomic weapon is synonomous with a bomb delivered by an airplane. We now have weapons which can be fired by artillery pieces and by rockets easily transportable by Army troops.

"We are intent upon developing versatile and flexible military forces, preparing to fight either the short war or the long war, the small war or the big one. In any case, we expect to have an army which is an instrument capable of keeping war as far as possible from the American homeland."

Air-Minded General Gets Army R & D Post

Lieut. Gen. James M. Gavin, World War II commander of the 82nd Airborne Division, was named Chief of Research and Development for the U. S. Army last month. Gen. Gavin is a strong advocate of the use of helicopters and assault cargo planes by Army personnel.

EAL Orders 40 Electras in $350-Million Expansion Program

Places option for 30 more in five-year plan to attain 15 billion seat-miles capacity by 1961; allocates $125 million for 20 U.S.-made straight jets.

Turboprop and turbojet aircraft will comprise the first-class trunk route fleet of tomorrow for Eastern Air Lines with today's four-engine piston-powered planes becoming a super-aircoach fleet capable of carrying upwards of 70% of the carrier's total traffic.

In between, on what Eastern terms "intermediate service," will be its fleet of 60 Martin twin-engined planes. It all adds up to an annual capacity of 15 billion seat-miles by 1961, or 160% more than presently available.

This progressive and optimistic picture was furnished by Eastern recently as it tied in its equipment transition program to announcement of a firm order for 40 four-engine turboprop Lockheed Electras, plus an option for 30 more.

• **In what it referred to** as a $350-million expansion program covering a five-year period, Eastern indicated it has budgeted $125 million for 20 American-produced straight jets, but that it hasn't yet made its choice. The Douglas DC-8 and Boeing 707 are under consideration.

As an equipment lead-in to the jet era, the airline confirmed previously-known orders for 40 Douglas DC-7Bs (eight of which have been delivered) and ten Lockheed Model 1049-Gs. These, together with present equipment, will "bridge the gap" to jet speeds. The Super-Gs, EAL said, are planned for use on the recently-inaugurated Eastern-Braniff interchange service between New York and South America.

These additions to EAL's "transition fleet" will have been "delivered and paid for at a total cost of $125 million by 1958," EAL said.

• **Step two in the program** will be the introduction of Electras as the new first-class plane on main trunk routes. EAL's original order of 40 Electras will cost about $100 million and makes Eastern the second U.S. airline to contract for this country's first turboprop passenger transports. In June, American Airlines contracted for 35 Electras at a cost of $65 million. But while apparently not first in line in orders, Eastern came up with the biggest order and is assured of equal delivery times.

First of the 66-passenger planes, capable of speeds "well in excess of 400 miles per hour" will be delivered to EAL in August, 1958, same as AA's first. Deliveries to EAL will be gradually stepped up to the rate of five per month with completion of the order due for July, 1959.

CAPT. E. V. RICKENBACKER (left), chairman of the board of Eastern Air Lines, signs contract for 40 turboprop Electras as Robert E. Gross, Lockheed president looks on.

If the option for 30 additional Electras is exercised, deliveries will begin in August, 1959, continue at a rate of two per month through March, 1960, and three per month until completion in November, 1960.

• **Unlike American, however,** Eastern has not yet decided on an engine or propeller for its Electras, although AA did take two months after its plane order to contract for 140 Allison Model 501 turboprop engines at a total cost of $12.5 million.

EAL's chairman E. V. Rickenbacker said initial performance figures have been based on use of 3,750 horsepower engines, but "I am confident that engines of greater horsepower will be available for commercial use by the time the aircraft is ready."

Using the 3,750 hp. figure, the Eastern Electra would weigh 98,500 pounds and have a range of 2,000 miles. In addition to its 66 passengers, the plane will have a six-place luxury lounge. By removal of the galley and other fittings used for first-class service, the plane could have a capacity for 91 passengers as a coach aircraft.

• **Rickenbacker noted** that it will be capable of operating into and out of any airport on Eastern's system and he predicted it will be the "work horse" of the industry for some years to come.

When the 40 Electras are added, Eastern's 1959 fleet will total 198 planes with a capacity of 10½ billion seat-miles annually, or 90% more than at present. Four-engine piston-powered planes will be converted to coach as replaced by the new turboprops.

Step three, of course, will be the introduction of straight jets on main trunk routes "possibly as early as the winter of 1959-60." Here is what Rickenbacker had to say about the current indecision as to type of jet: "We have budgeted $125 million for a fleet of 20 of these great jet transports, but we have not yet made a final choice.

"Our engineering team, for some years, has studied all developments in the jet field, both here and abroad. We are convinced that America's aviation industry has the superior manufacturing know-how to develop a jet transport, capable of meeting the exacting demands of our airline industry for dependability and efficiency.

"At the present time our engineers have not yet completed their evaluation of the Boeing 707 or of the Douglas DC-8 . . . Final decision will depend upon the warranties which can be made by both aircraft and engine manufacturers, particularly in terms of our specifications for speed, operating efficiency, safety, and a satisfactorily low noise level.

"When adequate assurances can be provided by the manufacturers, Eastern is prepared to place immediate orders."

• **Rickenbacker cited** two "major problems" yet to be overcome in the jet transport field. One is the perfection of a practical means for muffling jet-engine noise and, the other, the development of a dependable mechanism to provide "reverse thrust" for the jet engine.

"Considerable progress is being made on both these projects," the EAL head said, "and I am confident by the time the aircraft is ready, these will also be solved."

The 20 jets, which will supplement EAL's Electras in the first-class express market, will carry from 80 to 100 first class passengers or from 120 to 130 coach passengers. They would bring EAL's 1961 fleet to 218 aircraft: 60 turbine-powered first-class planes, 60 local service Martin aircraft and 98 air-coaches.

• **To cope with** the cost of the new fleet, EAL has come up with a financing plan which Rickenbacker predicts will set a pattern for the industry's transition to jet-powered transportation.

Although final details will not be completed before mid-November, the program was outlined this way:

"Briefly, the new financial program will represent a sharp departure from our previous policy of employing short-term bank loans in connection with the purchase of new equipment. Instead it will provide the capital as needed for new equipment but will defer repayment until the increased fleet, the source of anticipated increased earnings, is in productive operation.

"This will give the company a much wider latitude in the use of cash accumulated through the anticipated increased earnings and from reserves for depreciation.

"Together with the much longer period provided for repayment of borrowed capital, this means that the company will be less restricted with respect to dividends and will, at the same time, be assured of the financial means for taking advantage of any advances by which air transport services may be further technically and profitably improved."

• **Eastern's aim** is to enter the jet age with a productive capacity for 20 million passengers a year. For an airline that carried 5.8 million passengers a year ago, is this thinking too optimistically? Rickenbacker thinks not, and cites four supporting reasons:

• Although the airlines carried 35 million passengers in 1954, most were "repeaters" and actually only about 8 million people traveled, using the airlines from two to 20 trips during the year. "In a nation so travel-conscious and with so many advantages, including cost, on the side of air travel, the fact that only 8 million of the nation's 165 million are traveling by air is one measure of the great potential ahead for the nation's airlines."

• "Today, we have an entirely new generation which was born in the lap of aviation and which has grown into . . . earning power and leadership, and for whom the airplane is the most natural and preferred means of travel. And these are but the first of an endless series of new air-minded generations."

• At the present rate of growth, the population will reach 200 million by 1965 . . . adding 35 million potential customers for everything our country produces, including air transportation.

• "Add to these facts the dynamic tempo of our nation's commerce which is already geared to the speed of air transportation. The greatly accelerated pace required of all industry to keep up with the needs of our growing population and our additional production for world markets will give you a fourth practical yardstick for measuring the job that lies ahead for our air transportation industry." • • •

Lockheed Buys C50s

Lockheed Aircraft Corp. has taken delivery on two Beechcraft C50 Twin-Bonanza executive planes and has a third on order.

Selection of the Twin Bonanza, according to A. W. "Tony" LaVier, Lockheed director of flight operations, followed rigid testing of four available twin-engine models by a board of company pilots.

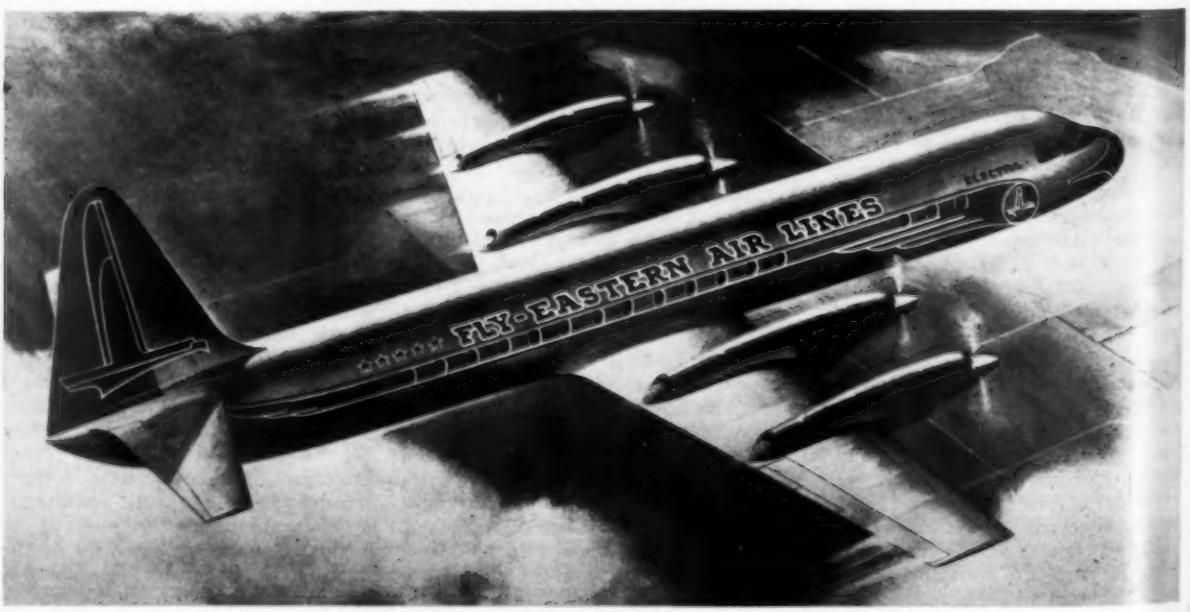
The new aircraft will be used to ferry employes on special assignment from its Burbank plant and for hauling light cargo on special assignments.

Plane Orders Continue

Orders by both foreign and domestic airlines for new transports continued at a steady pace late last month.

National Airlines disclosed plans to expand its fleet of 12 Convair 340s with an order for six new 440 Metropolitans for 1957 delivery.

Air-India International, meanwhile, ordered two more Lockheed 1049G Super Constellations, also for 1957 delivery. New aircraft will supplement AII's Constellation fleet of six planes, five already in operation and another due for delivery in May 1956.



Lockheed Electra (artist's conception) with Eastern Air Lines markings.

QUEHANNA

Pennsylvania

A new Curtiss-Wright Research and Development Center oriented to Airpower of the Future

To implement today's most advanced airpower plans . . . to stimulate and achieve the much greater power that the vistas of tomorrow require . . . Curtiss-Wright has oriented its engineering organization to embark on a new research and development program of unprecedented scale in an 85-square-mile, heavily forested area of Pennsylvania, to which the Corporation has given the name of Quehanna. The site has been part purchased, part leased for 99 years from the Commonwealth of Pennsylvania.

Here Curtiss-Wright is creating facilities which will enable power development to overtake vision . . . will expand the frontiers of air travel and space travel . . . as advanced powerplants, undreamed of yesterday, take shape in the engineering imagination, on the drawing board, and in production.

Curtiss-Wright's goal at Quehanna is to provide our armed forces with the finest in aircraft engines of every type . . . to provide our engineering forces with the *power* to transform their most advanced ideas into actuality . . . and at the same time to reduce lead-time and costs, providing America with *more* air force, *better* air force per dollar, *sooner*.

Central to air, rail and highway transportation . . . to the other Curtiss-Wright offices and plants and the whole industrial East . . . to ample power and water supplies . . . and to Pennsylvania's highly skilled manpower areas . . . Quehanna constitutes an ideal site for this significant new Curtiss-Wright facility.

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Hoover Commission Staff Report Critical of U.S. Offshore Procurement Program

Strong criticism of the U.S. Offshore Procurement Program to buy British fighter aircraft is voiced in staff studies attached to the Hoover Commission's Task Force Report on Overseas Economic Operations, published last month.

In a summary of the status of the Hawker Hunter in the program as of June 15 it is asserted that "while the Hunter, when corrected, may turn out in certain respects to be an improvement on the North American F-86, it is in the same class, subsonic in level flight, and has been so long in development that when fully delivered to the front line it will be approaching obsolescence.

"It will certainly be inferior to the F-100 and other types of supersonic U.S. and Russian fighters that may be expected to be in front line service and in quantity production by 1958. Unless Britain can afford to replace the Hunter with quantities of a new design, which seems unlikely, they will not have a modern day fighter at the end of four years. Accordingly, U.S. aid to the British Air Force under Plan K may turn out to be an unwise venture."

• **It is also said that:** "A recent evaluation of the Hunter by the USAF has satisfied our Air Force that the limitations of this plane can be cured by certain fixes which the British have agreed to install. Therefore, the Department of Defense has agreed to accept deliveries under the 1953 offshore contract with the understanding that the fixes will be made at a later date.

"The evaluation of the Gloster Javelin all-weather fighter has been postponed. A combat-equipped production model will probably not be available for test flying before the late autumn. This will be a year later than originally planned. The fiscal year 1955 funds earmarked for Javelin procurement have been reprogrammed, and it is understood that new appropriations will be sought for fiscal year 1956 to carry out the executive agreement of April 1953 in support of the military program."

Commenting on the aircrafts' alleged status at the beginning of 1955, the Hoover staff says: "The Hunter, Javelin, and Vickers-Supermarine Swift have been so long in development and found to have so many limitations and deficiencies that, by the time they are fully acceptable, deliveries cannot be made in full before the planes have become obsolescent and unsuited for first-line duty in competition with truly supersonic fighters of the latest U.S. and reported Russian designs."

It is also asserted that: "The Swift is reported to be in very serious difficulties due to lack of stability and there is even a very strong possibility that the ship may be canceled out by the Ministry of Supply."

Production of the Hunter is said to have been "greatly retarded by difficulties in the plane which have not yet been eliminated." It is asserted that "the few Hunters that have been accepted for squadron service are flying under very strict limitations and there are reasonable grounds to fear that one or more major fixes may still be required, thus further delaying deliveries of an acceptable plane."

• **The English Electric Canberra** is described as "a good light bomber which is reportedly nearing obsolescence and is not regarded highly as a weapon according to U.S. standards." The Martin B-57, American version of the Canberra, is said to be "a marked improvement in design, speed, armament and general capability." It adds that "we are informed that the B-57 is a superior plane to the Canberra and has a longer life expectancy in terms of front-line service. It has also been stated that if orders had been placed for the B-57 instead of the Canberra, which we are helping finance for NATO use, it would have meant jobs for between 12,000 and 15,000 workers at the Glenn Martin plant for one or two years."

• **Strong comments** are made on the Gloster Javelin all-weather fighter program. The study states that "the present status of the planes under contract can hardly be described as satisfactory. There is a question as to how much of the money (invested in the Javelin program), if any, can or should be salvaged." It also says that, "The question that may be raised is whether this action (to execute a Hunter and a Javelin contract in June 1954 to obligate the funds against fiscal 1954 appropriations in order to meet the June 30 deadline) constituted good judgment in view of what was then known about these planes and their limitations."

It is disclosed in the study that a contract was placed on a conditional basis in June 1954 for 177 Javelins at a total cost of $65 million. However, the production model crashed and test flights cannot be made until another production model is available.

"It was hoped that the plane would be turned over for evaluation by April or May of this year, but evaluation of the Javelin has again been deferred, since a combat-equipped production model cannot now be made available

Tigers Order 10 Cargo Connies

The Flying Tiger Line has ordered a fleet of 10 Model 1049H Lockheed Super Constellation cargo planes. Deliveries will start in early 1957. Order gives Lockheed a $40-million backlog for commercial cargo planes, with the FTL purchase amounting to about half that figure.

Cumulative Volume of United States Air Force's OSP Operations
(As of Dec. 31, 1954, in millions of dollars)

Commodity category	Procurement authority issued	Contracts awarded	Material accepted	Vouchers prepared for payment
Aircraft and spares	$456.9	$440.1	$12.2	$24.4
Electronics and communication equipment	49.6	25.5	2.5	2.2
Ground powered equipment	15.1	13.6	11.0	10.9
General equipment and maintenance supplies	39.9	30.4	13.2	13.0
Ammunition and explosives	22.2	21.9	1.9	1.9
Special military support	117.5	117.5	110.8	107.2
All other	15.6	14.1	2.7	2.7
Total	716.8	663.1	154.3	162.3

until late autumn—a year later than originally planned," the study states. Meanwhile, the funds are obligated but not finally committed.

• **The present program** to procure aircraft under OSP out of fiscal 1955 funds calls for approximately $100 million to be used in the procurement of 223 Javelins, provided the forthcoming evaluation proves satisfactory. At the moment these funds are earmarked under an informal executive agreement reached with the British Government in April 1953 for U.S. assistance in meeting UK commitments to NATO and in the modernization of the RAF.

• **Another of the staff studies** attached to the Task Force Report on Overseas Economic Operations shows that $463 million has been allocated to "U.S. support of the British military program during fiscal years 1953, 1954 and 1955." The major item in the program is the $141 million OSP contract of April 1953 for 465 Hunters. There is also an additional contract, executed in June 1954, worth $22 million for 50 additional Hunters. Javelin procurement involves two contracts, one worth $65 million for 177 aircraft and one worth $100 million for 223 aircraft.

The balance of the $473 million in the overall program, $135 million, is for the financing of the Swift fighter, the Canberra light bomber and one or more of the "V" medium bombers (Valiant, Victor and Vulcan), the study indicates.

• **The Task Force Report** studies devote most attention to the British program. It is observed, however, that both the Belgian and Dutch programs to produce Hunters under license under the OSP are behind schedule. Performance on the French OSP contract for Dassault Mystere fighters is described as "satisfactory," but the study adds that "a moderate slippage which occurred when the production schedule was adjusted to permit the incorporation of several engineering changes has been of little consequence."

Performance is also said to have been "satisfactory" on the Italian assembly of F-86Ks by Fiat. It is noted, however, that "serious difficulties are presented by the growing prevalence of Communist elements in labor unions at the Fiat plants."

The table reproduced below shows the cumulative value of the USAF's operations under OSP. • • •

End of Dispute over Site May Spur Construction of National Air Museum

Prospects for construction of a new National Air Museum, authorized by Congress more than nine years ago, may be getting brighter.

The Board of Regents of the Smithsonian Institution, which supervises the nation's collection of historic aircraft, last month was scheduled to try to iron out the controversy over a permanent site.

When Congress passed the law August 12, 1946, authorizing construction of a National Air Museum, it overlooked one important item. It failed to appropriate money. In 1953, after seven years of governmental inaction, Aircraft Industries Association and Air Transport Association, in a joint effort to push the project, contributed $12,500 each for an architectural survey for a museum on a suitable site in Washington.

Smithsonian officials have favored a site along Independence Avenue, between Ninth and Twelfth Streets. In the recent plan for the redevelopment of Southwest Washington, however, the museum was placed slightly east of that location.

• **The present museum,** located in two buildings of the Smithsonian Institution, has been waging a losing battle against deterioration of its collection of aircraft and engines, according to Paul Garber, head curator.

Available funds provide for only two workmen as a maximum, to be used on occasions when aircraft have to be moved, dismantled or repaired. Most of the time only one workman is available.

Some deterioration of vintage aircraft is hard to combat, Garber says, because it results largely from ravages of time and the requirements of display. On the other hand, both the original plane flown by Orville Wright and Charles Lindbergh's Spirit or St. Louis are in such good condition that they will require little more than ordinary care during the next decade.

On a recent visit to the museum, Lindbergh commented on the good condition of the Spirit of St. Louis.

The fabric-covered planes of World War I and earlier will require recovering in the near future. Some of this work already has been started. The original Langley model that forms part of the museum's original collection has been re-covered.

Open display defeats preservation of aircraft, Garber points out, but display cases, which would halt deterioration, are expensive and create a "dead" museum atmosphere.

• **Engines present** an even more difficult preservation problem than airframes. Ideally, they should be cleaned the same way modern engines are overhauled.

A building such as Congress undoubtedly had in mind when it approved a National Air Museum would solve most of these problems.

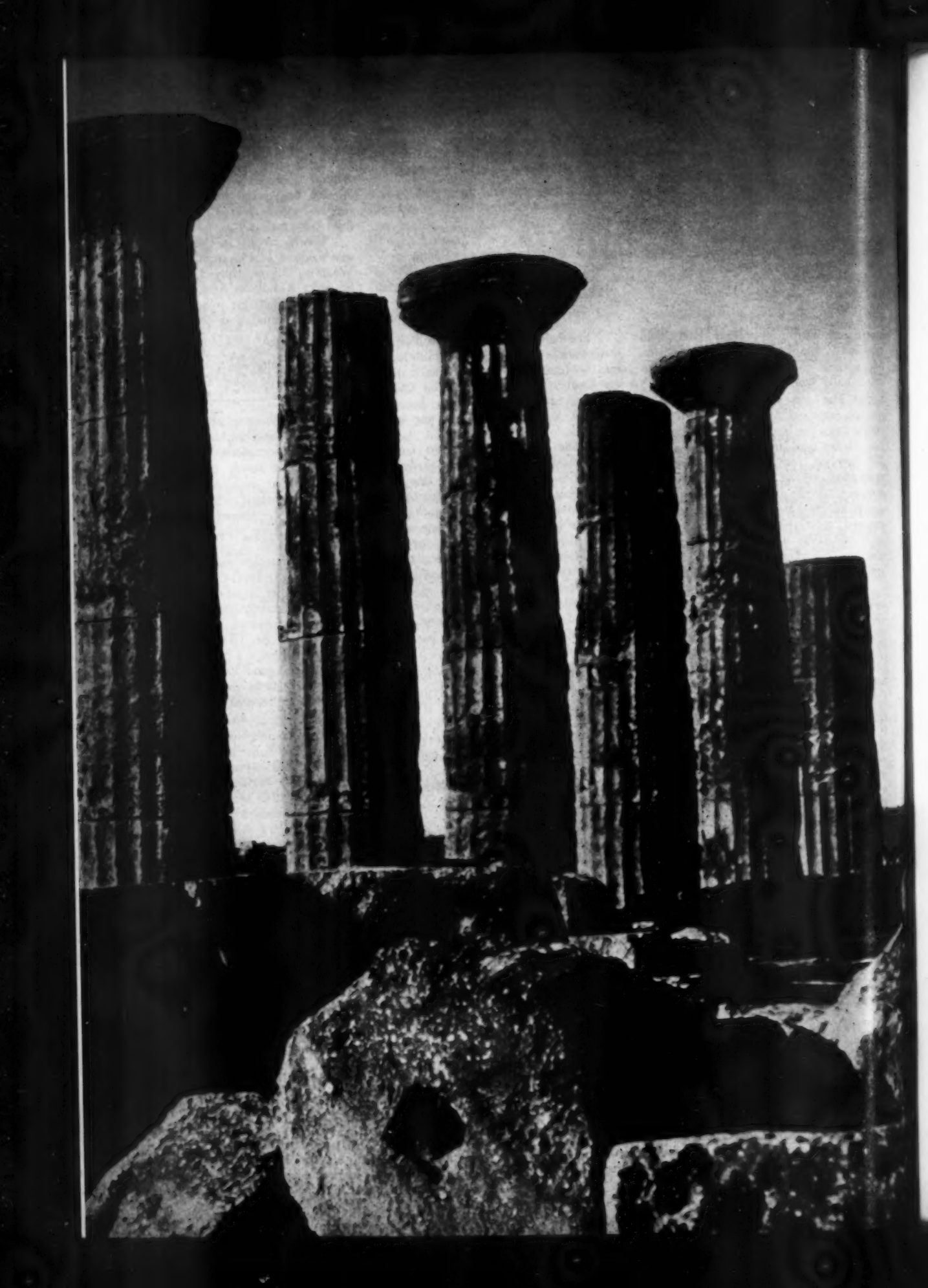
Presently, only 33 aircraft, representing one-fourth of the Smithsonian's collection, are on display. The remainder are housed elsewhere. The museum also has a collection of pictures, clippings and articles on aviation history.

McDonnell XV-1 Sets Unofficial Speed Mark

An unofficial world's speed record for helicopters was set by McDonnell Aircraft Corp.'s XV-1 convertiplane on its first conversion flight April 29. Recorded speed was "more than 180 mph," it was said.

World record for helicopters without payload is 156 mph, set by Army Warrant Officer Billy I. Wester in a Sikorsky XH-39 on Aug. 29, 1954.

McDonnell test pilot John R. Noll was not attempting to set a speed mark on the XV-1's flight. The convertiplane's doors were off, its undercarriage and rotor pylon were not streamlined and full engine power was not used.



PROGRESS NEEDS PROTECTION

The ruins of ancient Rome proclaim her empire one of the earth's great civilizations. An island of culture in a primitive sea, her people flourished as did art and commerce. But when Rome grew too busy to protect her progress, the barbarians smashed her cities and broke her glory.

Let us glance then at this past as we face a golden age of progress. For the past often mirrors the future. Knowing Grumman's past, for instance, is a reason the Navy depends on Grumman for the future.

In Grumman's twenty-five year past are the Wildcats and Hellcats of task force fame. With them Grumman broke aircraft production records. With them the Navy and Marines shot down two-thirds of the enemy planes destroyed in the Pacific Theater during World War II. In Grumman's more recent past are the Panthers, the first Navy jets to fight in Korea, and the three Cougars that flew coast to coast in 3 hours, 45 minutes, 30 seconds.

But this past is only a base for Grumman's research and brainpower to provide future progress in protection.

At right, model of F11F-1 Tiger fired by rocket to determine drag characteristics by latest research method.

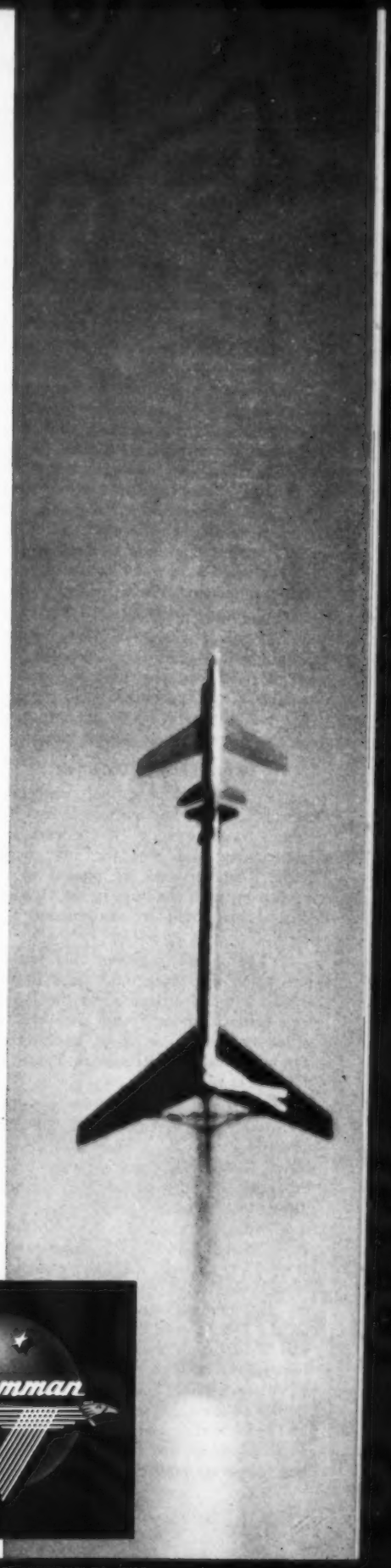
On the left, Temple of Herakles. Photograph courtesy Italian State Tourist Office.

* * * *

GRUMMAN AIRCRAFT ENGINEERING CORPORATION

Bethpage • Long Island • New York

Designers and builders of supersonic Tiger, transonic Cougar, S2F sub-killer, Albatross amphibian, metal boats, and Aerobilt truck bodies.



Campbell Report, Made in '52, Has Been Translated into Reality

AMERICAN AVIATION, taking note of many recent changes in the aircraft and engine production picture, asked the man who had recommended many of those same changes three years ago to comment on the situation. He said there was no point in having him reanalyze the present program in the light of subsequent developments, but pointed out that his 1952 recommendations still speak for themselves.

The man is William L. Campbell, who in mid-1952 became acting chairman of the Defense Production Administration's Aircraft Production Board, which at that time was charged with eliminating bottlenecks and getting plane and engine production going. His so-called "Campbell Report" created a furore at the time and Defense Department officials were quick to call it completely unrealistic.

These are the changes that Campbell, who is a vice president of Food Machinery and Chemical Corp. of San Jose, Calif., and who presently resides in New York, proposed back in July 1952 and the switches in the program that have been made in the interim.

Urged F84G Cutback

In the fighter-bomber category, Campbell urged that output of the Republic straight-wing F-84G be curtailed immediately and that the sweptwing F-84F Thunderstreak be phased in as a replacement if the bugs in the Curtiss-Wright J65 could be straightened out in time.

(The USAF followed this recommendation but those same bugs in the engine and the airframe put the F-84F well behind schedule and last year resulted in a stacking up of undelivered Thunderstreaks at Republic's Farmingdale, L. I., plant.)

Campbell called also for tapering off of the North American F-86F and its early replacement by the supersonic NAA F-100. He simultaneously urged expanded output of the NAA F-86D all-weather interceptor (and a consequent drop in production of the Northrop F-89 Scorpion and the Lockheed F-94 Starfire) because of the Sabre's superior capabilities.

He pointed out that dependence on the F-86D until the supersonic Convair F-102 could be placed in production would be advantageous because the F-86F and F-86D had similar configurations and used the same GE J47 engine and because their output at Los Angeles and Columbus was in line with Pentagon dispersal policies.

(The AF did end output of the F-94, retaining the F-86D and the F-89D. The F-86F was dropped in May 1954 as the F-100 started coming off the line but was reinstated earlier this year because of MDAP requests.)

On the Navy side, the acting APB head concluded in 1952 that the McDonnell F2H Banshee was superior to the Grumman F9F Panther series and called for conversion of Grumman's Bethpage, L. I., plant to Banshee production. He also advised the Navy to drop the Grumman F10F Jaguar in favor of the McDonnell F3H Demon.

(The Navy has since ended output of both the Banshee and the Panther, both straight-wing jets, but never made Grumman a second source for the McDonnell plane. Grumman subsequently came up with the sweptwing F9F-6 Cougar and the new supersonic F11F-1 Tiger while McDonnell is still turning out Demons. The F10F was canceled in mid-1953.)

Another Navy plane whose expanded production Campbell urged was the Douglas F4D Skyray as a replacement for the F3D-2 Skyknight. As for the piston-engine Douglas AD Skyraider series, Campbell said the plane was obsolescent and should be replaced by the A2D turboprop Skyshark despite the difficulties with the Allison T40 engine.

(The Navy quickly ended F3D output and the F4D is now coming off the assembly line. However, continuing troubles with the T-40 caused the Bureau of Aeronautics to drop the A2D and the multi-purpose AD piston plane is still in production.)

As far as the Navy's Douglas A3D and the USAF counterpart the B-66 were concerned, Campbell said priorities should be given to bring them into production quickly. And, he added, since the B-66 could perform all operational missions as well as the Martin B-57A light bomber, the B-57 line should be ended as soon as the B-66 started coming off the line.

(Both the A3D and the B-66 are now being delivered, but the AF has continued production of the Martin bomber as well. Troubles with a reconnaissance version of the B-66, the RB-66B, recently caused the AF to reshuffle delivery schedules for the plane, although there was no cutback in orders.)

Boeing's two bombers, the six-jet B-47 medium and the eight-jet B-52 heavy, were to receive top priority on production, at the expense of other bomber programs, according to Campbell. He simultaneously wanted the four-jet B-47C accelerated.

(Number of B-47s delivered is now in the neighborhood of 1,500 or more from Boeing-Wichita, Douglas-Tulsa and Lockheed-Marietta. The B-47C, however, was dropped. And the AF also abandoned the Convair B-60, a sweptwing version of the B-36, in favor of the B-52, which will start entering Strategic Air Command units this year.)

Powerplant Story

On the powerplant side, Campbell recommended:

- **Cancellation** of the Westinghouse J40-10 and -22, which was to be used in the F10F, F3H and F4D and substitution of the Allison J71-A-6 for the -22 in the Demon.
- **Stepping up** production of the GE J73-3, which he proposed for the F-102 and as a satisfactory engine for the F4D and the F3H-3. License Studebaker and Packard, who build the GE J47, to produce the J73.
- **Expanding output** of the Pratt & Whitney J57, including using the Westinghouse-Kansas City, Ford-Chicago, Chrysler-Detroit, and Lincoln-Mercury at Romulus, Mich., plants for production of the J57.
- **Canceling** P&W J48 output at Chrysler's facility.
- **Consideration** of canceling the Wright J65, but pointed out corrective measures might permit use of the engine for the F-84F and the B-57.
- **Deal** with the Wright J67, which also had run into problems, accordingly.

(To date, this is what has happened on the engines: The J40 development was stopped in the fall of 1953 and the J71 was the substitute chosen for the F3H-1, the J57 for the F4D and the A3D, and the F10F was eliminated. GE's J73 became the powerplant for the NAA F-86H and was considered as a substitute for the J65 in the F-84F.

(The J57 is now in production at P&W in East Hartford, Conn., and Ford-Chicago, powering virtually all supersonic Navy and AF planes. Westinghouse-Kansas City will run out of military orders at the end of 1955. Chrysler's J48 facility and Lincoln-Mercury's J40 plant to this day have never been used for engine production. The J65 program went ahead despite Campbell's report and the engine is now used on several Navy and AF planes. The J67, despite continuing bugs, is still in the AF picture.)

In general, then, most of what Campbell urged back in 1952 has come about despite military opposition at the time. It would appear that in many specific projects, Campbell anticipated developments. • • •

'Pi Tail' Improves Stability, Cuts Drag in New C-123B Design

Fairchild optimistic about proposed M-226, unique version of C-123B.

By ROBERT M. LOEBELSON

To the mathematician, the Greek letter π (Pi) denotes the ratio of the circumference of a circle to its diameter and has a value of 3.1416.

To an aeronautical engineer like Walter Tydon, however, π provides a means of improving aircraft stability and reducing drag. Its value is translated in terms of higher cruising speeds, improved rate of climb, and/or greater payload.

Tydon, chief engineer of Fairchild Aircraft Division at Hagerstown, Md., has just completed a series of wind-tunnel tests of a scale model of a modified C-123B type aircraft featuring a "Pi tail."

These tests have convinced him and other Fairchild officials that a Pi tail on a C-123 (and presumably on other aircraft with similar configurations, e.g., the Lockheed C-130) would greatly improve the airplane's performance and reliability.

He told AMERICAN AVIATION that Fairchild has proposed the construction of a prototype M-226 to the Air Force and added that the company is "very optimistic" about getting a contract to build at least one to prove his theories. The M-226 is Fairchild's designation for a C-123B incorporating a Pi tail and two tip-mounted Fairchild J44 turbojets of 1,000 pounds thrust each to augment the existing two Pratt & Whitney R-2800 piston engines.

(Tydon is also proposing an M-231 to the USAF's Air Research and Development Command. This plane substitutes Allison T56 turboprops for the R-2800s and also features the Pi tail.)

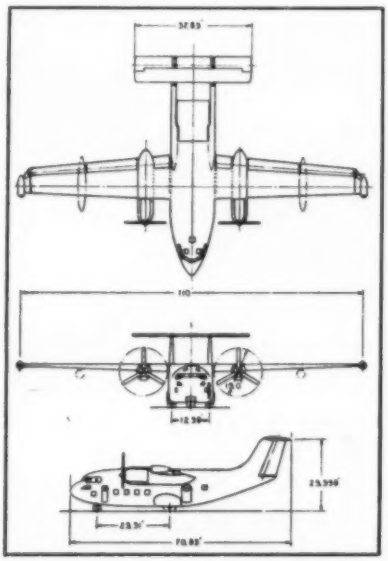
Among other things, Tydon's studies indicate:

• The M-226 with the Pi tail would have an average cruise speed at 75% normal rated power of 183 knots, or about 13 knots faster than the production model C-123B.

• The average cruising speed of the T56-powered M-231 would be 235 knots.

• Single engine rate of climb (in the M-231) would be improved by more than 500 feet per minute over the standard production airplane.

• The Pi tail, by increasing directional stability with increasing angle of yaw, aids in reducing tail loads in abrupt yaw and eliminates rudder lock conditions.



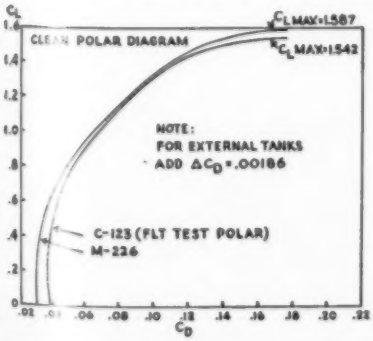
Both the M-226 and the M-231 have tails stretching just over 23 feet. Production C-123B tail tops 34 feet.

• By increasing longitudinal stability with increasing lift coefficient, i.e., decreasing speed, the new type of tail reduces power on stability losses at low speeds and thus allows greater center of gravity range.

The Fairchild designer believes the M-226 prototype (if one is authorized by the AF or if Fairchild decides to build one with its own money) would be the first airplane in history to use a Pi tail. Several aircraft use the single "T" tail (among them the Martin XB-51, P5M-2 and XP6M-1) and several others employ modifications of the double Pi tail (among them the British de Havilland Vampire and D.H. 110 jet fighters). But, Tydon maintains, only a true Pi configuration will give cargo planes like the C-123B so much improved performance.

In making the proposal for construction of a prototype M-226 or M-231, Fairchild is obviously hoping for a successor airplane to its C-119 Flying Boxcar. The last C-119 is now being built at Hagerstown and the only production item at the plant is the C-123B, which is not a Fairchild-designed plane but one which the firm is building because it was the low bidder in an AF competition after the Chase Aircraft Corp. and Kaiser Motors contracts were canceled in 1953.

To date, Fairchild has received orders for 237 of the C-123B Avitrucs. And while additional follow-on orders for C-123s are expected, not even Fairchild expects the present configuration to continue in production as long as the C-119 did.



Drag is considerably reduced by use of the novel tail section.

Piston version of the M-226 Pi tailed Avitruc features auxiliary J44 turbojets at the wing tips. M-231 uses only two T56 turboprops.

EVER LAND A JET ON A

U.S. NAVY'S TOUGHEST PILOT-TRAINING PROBLEM MADE EASIER BY WORLD'S SAFEST JET TRAINER.

LOCKHEED **T2V-1**

Once you try it, you know there's nothing trickier than setting down on a carrier at jet landing speed. Add fickle winds to a pitching, yawing, rolling deck, and there's plenty to think about, especially during early training.

That's why the Navy needed the world's safest two-place jet trainer. It's now in production at Lockheed.

The T2V-1 is the slowest-landing high-performance jet ever built—lands at less than 90 knots yet flies at close to 500 knots. It's the first U.S. plane ordered into production utilizing Boundary Layer Control.

With "BLC," compressed air from the engine is shunted into the wing, then blasted through tiny holes over wing flaps. This causes air flow to hug flap surfaces. *Result:* increased lift for safe landings at lower speed, shorter takeoff runs.

Other innovations of America's first carrier-based jet trainer: aerodynamically actuated slats on the wing's leading edge for better low-speed stability, elevated rear seat for fuller vision, a simplified and roomier cockpit, high-capacity landing gear.

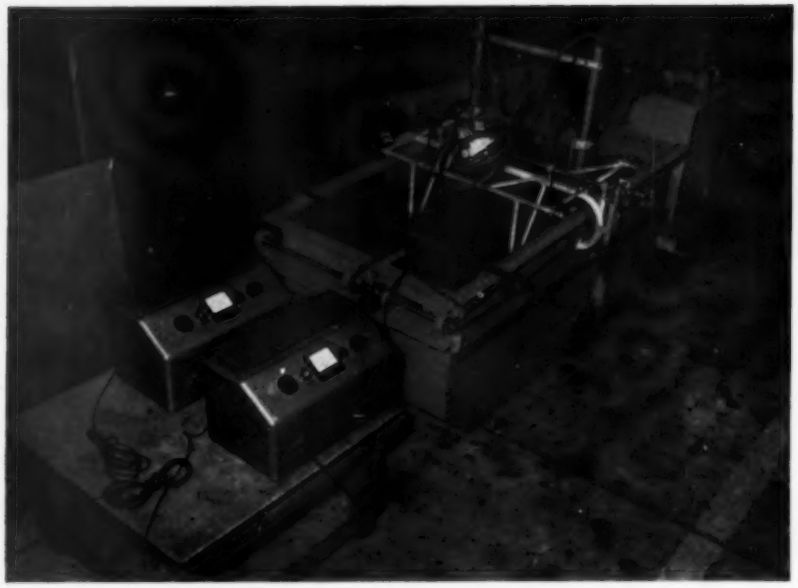
The Navy T2V-1 is a result of Lockheed's unmatched experience in building over 4,000 jet trainers—starting with the T-33, the world's first operational jet trainer.

A FLATTOP?

LOCKHEED

AIRCRAFT CORPORATION
BURBANK, CALIFORNIA

LOOK TO LOCKHEED FOR
JET LEADERSHIP, TOO



ULTRASONIC OIL COOLER cleaning unit now in use by KLM employs two sound generators, cuts cleaning time from 7½ hours to one hour.

KLM Employs Ultrasonics Technique To Speed Cleaning of Engine Parts

Use of new concepts of industrial cleaning that employ ultra-high frequency sound waves (ultrasonics) as the cleansing medium are speeding engine overhaul operations for KLM Royal Dutch Airlines.

In one of its first applications of ultrasonics to a major engine component, according to J. Luymes, v.p. engineering and maintenance, KLM found that cleaning time for oil coolers could be cut from 7½ hours to about one hour.

Move by the airline into ultrasonics for cleaning engine parts, is an outgrowth of earlier experience with its use on a small scale and solely for cleaning ball bearings of flight instruments.

"We were able to clean our used ball bearings so well," says Luymes, "that they were cleaner than the new ones. We even went so far as to clean all new bearings before use."

Equipment used by KLM is built by the firm of Dr. Lehfeld & Co. located in Heppenheim, West Germany. U. S. licensee for the Lehfeld company is Curtiss-Wright Corp., which earlier this year unveiled plans of its own for adapting ultrasonic cleaning to engines built by Wright Aeronautical Division.

Following success with cleaning instrument bearings, Luymes told AMERICAN AVIATION, KLM was eager to broaden the field where ultrasonic cleaning could be used. One of the first problems the airline sought to tackle was the cleaning of oil coolers—always a difficult and laborious procedure requiring considerable manpower.

The difficulty was to find an adequate medium through which the ultrasonic waves will travel and be propagated. In the instance of the oil cooler, it was placed in an open tank filled with water and so arranged that two movable crystals for transmitting the sound waves could be moved alongside the cooler.

To make sure that both faces of the cooler are scanned, the movable elements (called phonodes) were made to move in a clearly defined pattern. As a result, the accessory is "bombarded" with ultrasonic waves while trichloroethylene is circulated through it to remove displaced carbon deposits.

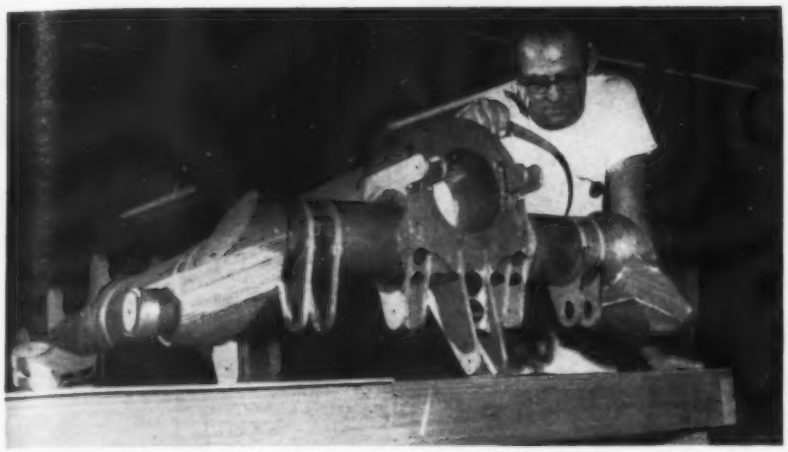
This residue is then filtered off and the solvent is again pumped through the cooler. In the oil cooler cleaning unit, the energy transmitted by the phonodes is 10 to 20 watts per square centimeter and the frequency is 800,000 cycles.

Despite the marked advantage of ultrasonic methods, however, KLM still finds it necessary to remove some oil cooler tubes because of contamination by metal particles as the result of engine failure. Present aim of both the airline and equipment producer is to improve the new cleaning method so that ultimately the tube-removal operation can also be eliminated.

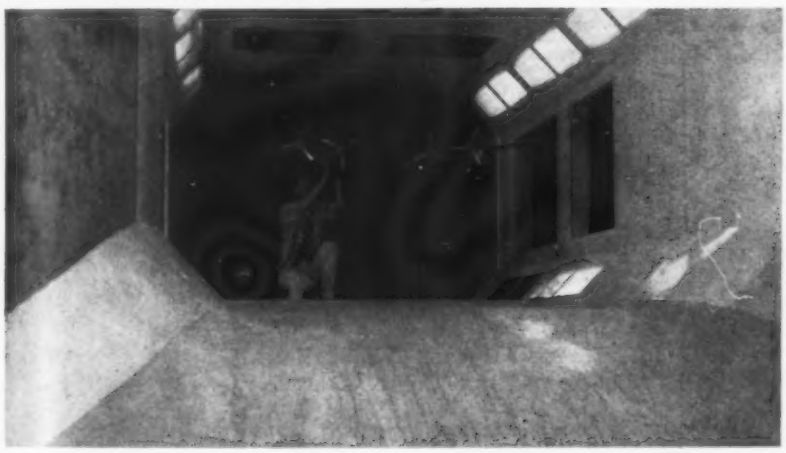
How to Dry A Runway

New approach to solution of runway water hazard in high-speed jet operations is this Aeroduck mobile "blotter" developed by Comex-Fraser Tuson Ltd., London. Designed by British engineer Frank Elve, new unit draws up 400 gallons of water in a matter of minutes.

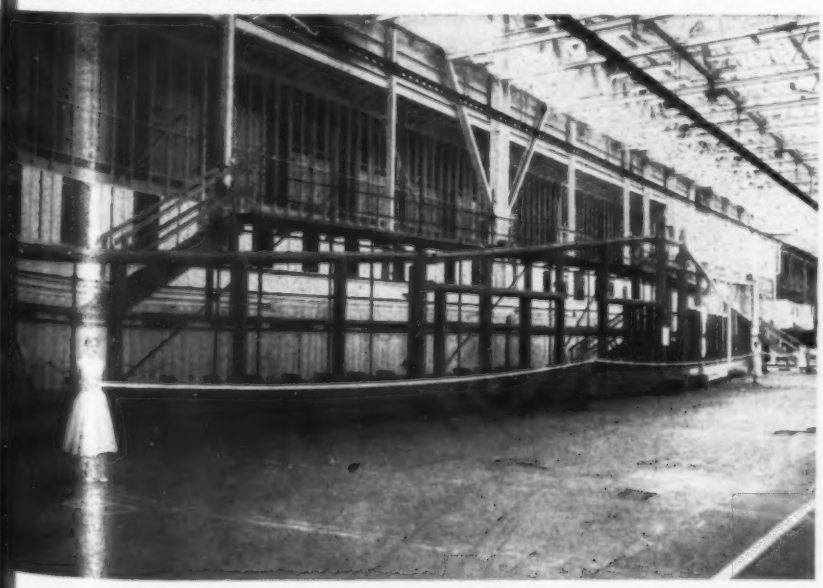
Lockheed Shapes 1649 Production Schedule



ENGINEER STUDIES effect of propeller stream on new 1649 airfoil in wind tunnel tests. New thin wing helps speed up latest Constellation to 350 mph.



CARPENTER USES CALIPERS to measure fulcrum arm on the upper part of the 1649 main landing gear support. Wooden gear mockup is made from mahogany and maple plywood and was built in two weeks.



NEW TECHNIQUE in Super Constellation assembly involves this 150-foot long, one-piece wing jig. After wings are assembled on it in vertical position, they are turned to horizontal and affixed to fuselage. Left and right wings were formerly mated to stub sections on fuselage.

The two most outstanding features of Lockheed Aircraft Corp.'s new 1649 Super Constellation are its high-speed wing and its tight production schedule and both are beginning to take shape at its Burbank headquarters.

Howard Hughes announced purchase of 24 Model 1649s on April 18 this year and first delivery to Trans World Airlines is scheduled for April 12, 1957—only two years to the month.

Key production dates now set by Lockheed include:

- Flight test instrumentation—August 24, 1956.
- Roll out—September 17, 1956.
- First flight—October 1, 1956.
- CAA certification — March 31, 1957.

Meanwhile, Lockheed has begun to cut metal on the 1649. Wing beam and web milling operations are under way and Factory Area A-1, formerly used for 1049G wing finishing operations, has been mapped out for similar work on the 1649.

Lockheed's engineering force of 450 under direction of project engineer Art Flock is at full strength. Of 967 major jobs, engineering has released 517, with 98.3% of these either on or ahead of schedule.

Materials planning is well under way. Lockheed figures it will take some 38,000 shop orders to build the 1649. To date 8,014 have been written and released. Within the next five months, 80% of the total will have been completed in placing fabrication on its original tight schedule.

SINGLE 50-FOOT rear beam cap of 75ST stock is produced in one hour on this Onsrude spar mill.

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Integrated

New system provides simpler, more pictorial cockpit information

MORE FLIGHT DATA, in clearer visual form, in less space . . . this is a modern cockpit need now answered by Sperry instrument specialists. With the Sperry Integrated Instrument System, three new instruments are incorporated into the basic six now in common use, giving the pilot more of the data he needs—simply, conventionally, pictorially—without increasing the number of instruments on his panel.

The Sperry Integrated Instrument System consists of a more accurate and reliable primary direction instrument, a combined flight director and gyro-horizon, and a pictorial deviation indicator. Manual control of higher performance aircraft—through all phases of VFR and IFR flight plans—can be an orderly, efficient procedure with these panel aids.

NEW THREE IN BASIC SIX

Model C-6 Gyrosyn* Compass uses a master indicator with RMI (Radio Magnetic Indicator) presentation and data transmitters for providing accurate heading information to other equipment. A settable course marker also serves as the heading selector for the flight director. Model C-6A Gyrosyn Compass is also available with integral switch for selecting input to radio pointers.

Model HZ-1 Horizon Flight Director is a pictorial horizon with conventional sensing, effectively combined with the well-known Sperry Zero Reader* Flight Director. The non-tumbling horizon is graduated to ±90° in pitch from level flight and provides pitch and roll attitude information at all times while flying "zero" on the Flight Director. When not in use the Flight Director pointers can be retracted from view.

Model R-1 Pictorial Deviation Indicator displays aircraft position with respect to ground radio facilities. It includes a new pictorial presentation of the TO and FROM zones of VOR, and an omni-bearing selector. On ILS it provides both glide path and localizer deviation.

The System also includes a new lightweight, transistorized computer for more stable coupling to ILS during manual approaches. This Model Z-4 Flight Director Computer is completely free from the effects of cross-winds and varying pitch attitude resulting from changes in speed and loading.

The Integrated Instrument System is flexibly adaptable to all types of installations for present and future aircraft. The Sperry Model A-12-I Gyropilot* includes these new panel instruments and is operated from the same remotely mounted, non-tumbling gyros.

For complete information write our Aeronautical Equipment Division.

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FINANCIAL

Aircraft Industry Future Is Keyed To Fundamentals, Not Mass Hysteria

By SELIG ALTSCHUL

Political and business uncertainties resulting from President Eisenhower's illness call for a reappraisal of investment fundamentals as they may pertain to the aircraft industry. The initial market response to the President's illness was a collapse of industrial stock quotations with aircraft equities showing prominent price declines. Superficially, this would indicate great uncertainty and likely difficulties ahead for the aircraft industry.

A careful analysis would indicate otherwise. The aircraft industry will, in the future as it has in the past, be influenced by those basic factors which determine ultimate earnings and dividends. The mass hysteria which was evident in the initial sharp market price declines for industrial equities were a primary manifestation of political uncertainties centered on the probabilities of a second term for President Eisenhower.

• **It must also** be recognized that industrial share prices were at a crest of a sustained rise without much of an interruption. Aircraft equities participated in this market appreciation to a considerable degree. Hence, a technical correction was regarded as long overdue and it took an event such as the President's illness to "trigger" a sharp decline.

It may be argued that political uncertainties may lead to sharp reductions in present levels of aircraft procurement and therefore have an adverse consequence on the industry. As such, these political uncertainties are a major market influence and will continue to be so as the prospects of the 1956 elections run a continuing evaluation. It must be observed, however, that no Administration is going to follow a course likely to precipitate a recession and unemployment. To this must be added the risk of reducing aircraft expenditures so as to weaken the military air arm of the country.

• **As a practical matter,** any Administration in office may be expected to pursue those policies that will continue to sustain record levels of production and employment. And building a strong military aircraft complement as a matter of national policy is a popular means of accomplishing full employment. For this reason, political changes may affect economic policies far less under present conditions than would be the case were the economy in a recession.

As this view gathers greater currency, markets may not for long continue to be sensitive to political developments.

Pricing Pressures

It is far more important to focus on the various elements swirling about the aircraft industry and which are directly related to their impact on the group's capabilities in generating a measure of profitability. Rarely have there been as many conflicting trends and areas of confusion for the aircraft industry as prevail today.

The record-breaking earnings of 1954 and the outlook for a continuation of this experience for the industry as a whole in 1955, has brought pressures for closer contract pricing and tighter renegotiation procedures. Also, Congressional investigations of aircraft profits have again appeared in the limelight with the publication of a staff report on the subject by the Preparedness Investigating Subcommittee of the U.S. Senate Committee on Armed Services.

• **To this has been added** the threat of possible cuts in aircraft procurement due to the desire for a balanced budget by the Secretary of the Treasury. To confuse the picture, a report attributed as prepared for the National Security Council proposes an increase in U.S. air power to offset alleged Russian gains in this field.

The most recent contribution to the industry's potpourri of confusion is the now revealed Air Materiel Command's warning that aircraft builders will be penalized for specified performance and delivery deficiencies.

• **More important,** a far-reaching and constructive factor in the industry's outlook was revealed by the AMC's Director of Procurement and Production forecast of U.S. Air Force level of aircraft expenditures. For 1955, deliveries are estimated at $6.6 billion compared to $6.2 billion for 1954 and $5.6 billion for 1953. Most significantly, the AMC Directorate's estimate projected "slightly higher deliveries in 1956, 1957, 1958, and 1959."

Here was one of the most encouraging statements by a responsible source which cut clear across the conflicting reports as to the near-term level of aircraft production. It was a statement, if fulfilled, and there is reason to believe it will be, that augurs for a sustained if not higher level of production to meet Air Force demands alone, to say nothing of Navy requirements. No industry could have a more hopeful prospect, in this statement, as to projected sales levels for four years in advance.

It must be clearly understood that there will be no uniform distribution of Air Force procurement in the aircraft industry. If anything, competition will be heavily intensified. Technological proficiency and improvements, plus shifts from aircraft to guided missiles will figure prominently in the awards to individual contractors.

It is therefore a reasonable surmise that gross sales for the industry will most likely be well sustained if not increased. The degree of profitability that may ensue is far more difficult to define. It may be some time before the effect of new policies of closer contract pricing and renegotiation on earnings may be known.

• **At the moment,** Congressional investigations have their greatest threat in the psychological factor. Unless a conclusive finding can be established that the aircraft industry generated unconscionable profits, no new legislation affecting the group is likely.

It is an established premise endorsed by a previous Congressional group (The Congressional Air Policy Board) that only a financially sound aircraft industry is capable of assuring this country's military air supremacy. For this reason, it is logical to expect that successful aircraft builders will be permitted to generate and retain a reasonable measure of earnings.

UAC Banks on Future

A manifestation that the outlook for the aircraft industry is indeed encouraging may be found in the current financing being undertaken by United Aircraft Corp. This leading aviation enterprise is offering 243,469 shares of a new convertible preferred which is designed to raise more than $24 million in funds. Some $23 million of this money will be utilized to retire 225,746 shares of the presently outstanding 5% preferred.

In other words, this is primarily a refunding operation designed to reduce the cost of equity to the company by placing a lower dividend rate (to be announced) on the new prefered. Were there any great uncertainties in the aircraft general outlook (and for the company in particular), it is doubtful if United would have attempted this refunding operation at this time and through a convertible preferred which has a call on an increased participation of potential earnings through the common stock.

AMERICAN AIRLINES

America's Leading Airline

chooses Allison Turbo-Prop Power for 400-mile-an-hour luxury travel

New Lockheed Electras to give America the world's fastest, smoothest flights

AMERICAN AIRLINES has ordered Allison Turbo-Prop engines to power its new fleet of Lockheed Electra four-engine airliners to give America the world's finest air travel.

The Allison Turbo-Prop engine was chosen because it is the most advanced propeller-type aircraft engine available here or abroad – and the first Turbo-Prop to receive Civil Aeronautics Administration approval for commercial service.

The Lockheed Electra has been specially designed to take advantage of this new concept in aircraft power, and represents another major advancement in air transport.

These great new 64-passenger airliners will fly at speeds of more than 400 miles per hour–saving up to an hour on popular flights. They will operate from any airport now served – with much shorter take-offs and landings. And they will bring remarkable new standards of smoothness and comfort to air travel. These new luxury airliners are scheduled for delivery in 1958.

General Motors salutes American Airlines on this important step in continuing the advance of American aviation–and we are proud of our contribution to the progress of American-designed and American-built aircraft.

ALLISON DIVISION OF GENERAL MOTORS • Indianapolis, Indiana

The Allison Turbo-Prop engine is backed by more than six million hours of turbine engine flight time– experience where it counts most –in the air!

ALLISON TURBO-PROP ENGINES

AMERICAN BUILT FOR THE NEW ERA IN AIR TRAVEL

Photo-Eye Sees Red To Detect Rocket Fires

By HENRY P. STEFER

Spotting and extinguishing fires in aircraft has long been a perplexing problem. Today, the problem has become aggravated by the introduction in jet fighter designs of submerged rocket stowage to reduce drag. AMERICAN AVIATION has learned that an electronic device so small it can be held in the palm of the hand shows promise of solving the problem of extremely rapid detection and ejection of the entire rocket "package".

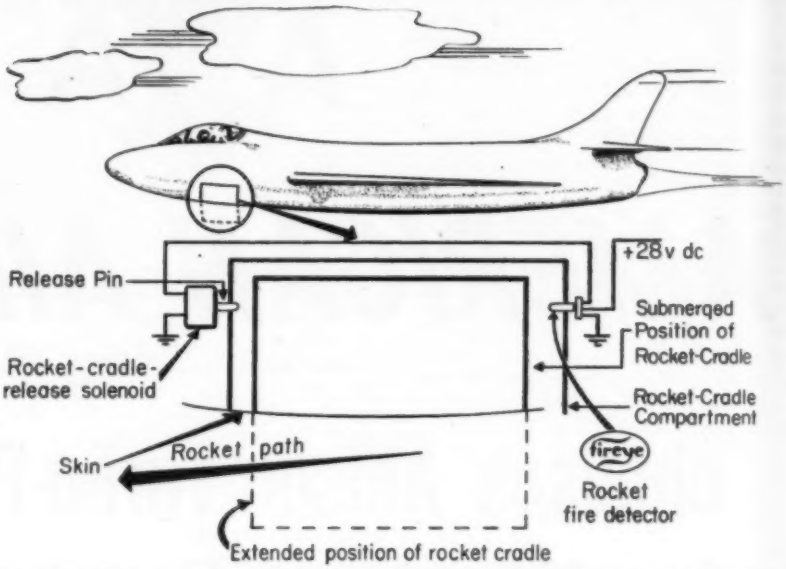
Spuriously ignited or improperly released rockets are known to burn through an aircraft's metallic structure in less than four-tenths of a second when the exhaust flame, which reaches nearly 3,000°C, impinges directly on the airframe. Fireye Division, Electronics Corporation of America has come up with a system using a lead sulphide photoconductor cell sensitive to infrared radiation.

• **The ECA-developed cell** detects with the speed of light, unlike common temperature-rise or pressure-rise detectors. Called *Fireye*, the cell indicates rocket-fire by very rapid resistance change and utilizes the fast rise in the radiation characteristic of the rocket-fuel type of combustion. When a DC voltage is applied to the cell, this rise in radiation results in a pulse being transmitted to the control section that sends a signal to a relay which in turn activates a rocket-release mechanism.

According to E. D. Reddan, vice president, Fireye Division, ECA, in recent tests performed by one of the nation's leading combat airframe manufacturers, the detector spotted a fire in submerged rocket installations in five ten-thousandths of a second, and rocket-cradle ejection took place well within the safety limit time of three-tenths of a second.

In use, the entire rocket compartment can be monitored with one or two detectors. The coverage pattern that the five-inch-long, 1 1/16-inch diameter, *Fireye* cell sees is greater than hemispherical, despite the fact that the "eye" of the glass envelope, coated with infrared sensitive lead sulphide, is approximately hemispherical in shape. This is because light in the "near infrared" region is highly reflected from many surfaces, even more so than radiation in the visible spectrum.

• **A significant feature** of the system is that sensitivity limits of the photoconductors were chosen to take care of open mounting. The detector need not be installed in a light-tight compartment. Sunlight or any radiation other than that from a high-energy intensity flame, such as a rocket flame, will not actuate the rocket-cradle ejection system.



Schematic diagram of Fireye rocket fire detection system that releases a rocket cradle in new combat aircraft and allows misfired or improperly released fired rockets to burn out outside the plane.

Operating from a voltage source that may vary from 24 to 30 volts DC, the photoconductive cells are highly resistant to vibration. Unlike photoelectric or photovoltaic cells heretofore used on aircraft, Fireye cells have no internal mechanical structure that might fail under vibration stresses. Their life expectancy in use is 1,000 hours minimum.

Designed to operate at from —65°F to +160°F, the cell's variation in sensitivity is flat from —50°F to +50°F with a decrease to a relative 0.59 at +150°F. • • •

Titanium-Ceramic Vacuum Tube Seen As A 'Natural' for Automation

A fresh approach to limitations of the conventional vacuum tube is represented in the General Electric Company's latest receiving tube design now in pilot production. Using ceramic and metallic discs, the design brings within sight new standards for rugged, small-sized tubes that are expected to overcome many of the "blocks" to vacuum tube application that only transistors or magnetic amplifiers could formerly beat.

A micro-miniature triode, designated the 6BY4, incorporates a marked departure from conventional materials and manufacturing methods. Of metal and ceramic construction, about three-eighths of an inch long, and five-sixteenths inch in diameter, the new tube has ratings based upon an operating frequency of 900 megacycles. Although this first design is meant for UHF television sets, several versions of the tube in multi-element versions are in development. The military is expected to apply the design features to its tube requirements.

• **The tube structure** uses "doughnut" type discs of ceramic and titanium mounted co-axially to form a rugged tube envelope. Electrical contacts to the anode, grid, cathode and heater elements are made at the outside of the discs. The ceramic discs act as insulators between the tube elements.

Several years of fundamental research in tube design, ceramic materials and titanium by GE were followed by practical application of the new materials and methods at the GE tube plant in Owensboro, Ky. Goal of the development was a tube for use in any electronic equipment requiring motion, high temperature, restricted space, ultra-high frequency performance, and for

Engine heat-up time—external ground equipment—6 hours

Engine heat-up time—UAP cold weather oil system—30 minutes

Balance out the continuing use-cost of ground heating facilities with its attendant consumption of time and manpower against the one-time cost of the UAP COLD WEATHER OIL SYSTEM installation.

The UAP COLD WEATHER OIL SYSTEM is designed to furnish *fluid* engine oil after cold-soak at –65°F. without the application of external heat. This initial oil supply is then utilized after engine heat-up to thaw out the make-up oil in the tank outside of the hopper. Oxidation of the oil (sludging) is minimized by the system's deaerating features.

The system is for retrofit on most of the dry sump engines in use at the present time and is in every day service on more than 300 single and multi-engined planes.

Used in conjunction with UAP COLD WEATHER OIL SYSTEMS at temperatures lower than –30°F. is the UAP HOT FUEL PRIME SYSTEM which insures safe, reliable engine starts in 3 minutes or less. Both systems remain installed but inoperative during warm weather flying.

For prompt quotes on UAP COLD WEATHER OIL SYSTEMS cost and delivery factors on existing designs, please send detailed dimensional drawings of your oil tank to UAP Engineering, Dayton, Ohio. For descriptive literature covering both systems please contact any of the UAP Contractual Engineering offices listed.

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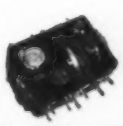
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Cold Weather System Hoppers

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Progress is being made in the Applied Nuclear Field at CONVAIR — Fort Worth — in nuclear analysis, design and experimentation, including the fields of shielding, radiation effects and nuclear aircraft technology.

As an integral part of General Dynamics Corporation's program of pioneering in Nuclear Fields, CONVAIR'S activities afford inviting opportunities for engineers and physicists to enter into Nuclear Development at its most advantageous stage.

CONVAIR'S Nuclear Program offers highly rewarding career opportunities both by way of professional accomplishment and personal income. A company-sponsored, in-plant program enables candidates to earn graduate degrees in Nuclear Engineering.

Fort Worth in the Great Southwest has an abundance of sunshine and dry, fresh air conducive to outdoor living and recreation. Within a few minutes drive of Fort Worth are seven large lakes which provide ample facilities for fishing and other water sports.

For further details write M. L. TAYLOR
CONVAIR Engineering Personnel Dept. UU
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A DIVISION OF GENERAL DYNAMICS CORPORATION
FORT WORTH, TEXAS

HERE'S HOW conventional tube sizes compare with new GE micro-miniature design. At left, conventional glass tube; center miniature type; right, micro-miniature introduced by General Electric Co.

manufacture by automatic assembly methods.

Manager of the GE receiving tube engineering sub-department at Owensboro, R. E. Moe, said vibration tests on the tube up to 100 g's showed that very little microphonic noise was produced. This characteristic should make the design particularly suitable to radar and rf amplifier circuits where noise is especially troublesome, and in missile or even satellite applications.

• **Regarding operating frequencies,** Moe said the design is "inherently suited to operation as high as 10,000 mc," with, of course, a drop in gain. Present power gain is about 15 decibels at 900 mc., with a noise factor of about 8 decibels, when operating with a bandwidth of 10 mc.

The exhaust and sealing techniques used in the production of the new tube are said by GE to be unique in the field of vacuum tube manufacture. Since the tube construction calls for vacuum-tight seals between ceramic and titanium materials, a special alloy was developed to "wet" the ceramic during "outgassing" of the tube.

Unlike most tubes, the new assembly is bonded together on the exhaust machine during time occluded gasses are being driven out of the envelope by application of high temperatures, in an oven. This saves a manufacturing step. Nature of the "wetting" alloy is a GE secret, as are the exact characteristics of the specially developed, high purity ceramic material.

For many years a high cost factor in tube manufacturing was the hand-assembled tube "mount," or internal mechanical structure. The simple stacked structure of the 6BY4 lends itself naturally to automation of the entire assembly and processing of vacuum tubes. • • •

Now ALL FREIGHT AIR SERVICE for the TWIN CITIES

Minneapolis - St. Paul

On Sept. 15, 1955, the Flying Tiger Line inaugurated the first all-freight air service for the Minneapolis-St. Paul area.

Now Twin-City shippers are enjoying the benefits of regularly scheduled all-freight air service by the world's first and largest all-freight airline.

MINNEAPOLIS — ST. PAUL

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- FLYING TIGER

The Flying Tigers are pleased to add their name to the list of distinguished carriers serving the "Upper Midwest."

Space for Interline Shipments on Flying Tiger's all-freight planes is always available to other airlines. Contact your nearby Flying Tiger representative — he's eager to help you in any possible way.

FLYING TIGERS

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TRANS-WORLD AIR LINES

These Leading Air Lines are installing RCA's New Weather Radar

PAA

AMERICAN WORLD AIRWAYS

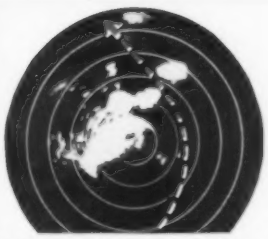
Simplicity, light weight, efficiency and dependability are the reasons for this preference

More and more leading air lines are equipping their ships with RCA's new weather-mapping radar. Their choice has been based upon exhaustive comparisons.

RCA's AVQ-10 is the first airborne radar to use C-Band (5.6 cm) transmission, the wave length most suitable for "looking into" storms, yet having the least amount of scope clutter. It presents the pilot with an easily-interpreted display of storm conditions around him. In addition, it gives the pilot valuable ground-mapping information.

In terms of time saving and increased passenger comfort, the RCA AVQ-10 weather radar is more and more becoming a "must" among air lines. With it, pilots can "see" into storm areas many miles ahead and pick non-turbulent paths between them, often making long and costly detours unnecessary.

RCA is proud that these distinguished air lines have chosen the AVQ-10 to save time and increase passenger comfort. Every effort will be made to meet additional commitments occasioned by the great and growing demand for this equipment. To assure early installation, other air line and private operators are invited to write immediately for further particulars on the RCA AVQ-10. Overseas customers should get in touch with the RCA International Division, 30 Rockefeller Plaza, New York City, or any RCA International Distributor.



Dotted line shows how airplane passed between storm cells in its flight path.

Minutes and miles are saved when a pilot is able to find a smooth path through turbulent areas.

AVQ-10 antenna mounted in nose of airplane scans the forward areas, enabling the pilot to evaluate storm conditions far ahead.

RCA

COMMERCIAL AVIATION SALES

RADIO CORPORATION of AMERICA

ENGINEERING PRODUCTS DIVISION CAMDEN, N.J.

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Structurally, they are designed to assure safety factors in excess of conventional requirements.

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MANUFACTURERS:
THE AEROTHERM CORPORATION
BANTAM, CONN.

Circle No. 15 on Reader Service Card.

New Products and Processes

JET ENGINE STARTER

Gremco, Inc. has developed a powerful new jet engine starter, operating on the pneumatic principle, that utilizes a 340 horsepower stream of air to start the huge turbojet engines powering the twin-engined Douglas B-66 bomber.

By starting a steady stream of high pressure air directly to the aircraft, the Gremco Air Start takes the place of the jet compressor to operate accessories normally supplied with air from the jet's compressor. As a result, ground crews can operate and check many accessories without having to start the jet engine as a source of power.

Tests on the Allison T34 turboprop are said to show the starter to be equally effective in starting propeller-driven jets.

Circle No. 162 on Reader Service Card.

ANTI-CORROSIVE PAINT

A thermoplastic, resin-base paint that contains what is said to be an extremely efficient inhibitor of rust and corrosion has been announced by **Corro-Vent, Inc.**

Trade-named Corrovent, the paint is easily applied by brush, spray, dip or flow-coat processes and dries within 30 minutes to a durable, high-gloss film which, according to the manufacturer, cannot crack, chip, peel or blister. It is said to be resistant to acids, alkali, alcohol, water, salt, grease, vegetable and mineral oils.

Circle No. 152 on Reader Service Card.

FLIGHT CASE

Jeppesen & Co. offers a new flight case designed for maximum accessibility in the cockpit. Called "The Pilot," the case resembles an open box when the top is folded back. Design features are said to have been dictated by needs of pilots of all types of aircraft.

Made of top-grain cowhide and lined with vinyl, the case has a cut-out front for easy access and a single compression-type handle. It is available in "manual brown" (matching Airway Manual binders), ginger brown and black. Price, $28.75 plus tax.

Circle No. 150 on Reader Service Card.

CIRCUIT ANALYZER

An automatic electrical circuit analyzer that is said to be capable of testing 80 circuits in about eight seconds has been announced by **DIT-MCO, Inc.**

Designated as the Model 80 Analyzer, the unit is capable of testing for all types of errors resulting from incorrect connections, short resistance between circuits and insulation resistance. In addition, it can functionally test such devices as relays, solenoids, actuators, panel lights and resistors.

According to the manufacturer, the Model 80, like its predecessor, the Model 200, helps break the production bottleneck that formerly existed in the testing of complex electrical circuitry.

Circle No. 151 on Reader Service Card.

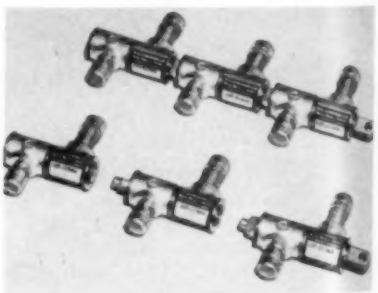
SEAT BELT

A nylon-rayon seat belt with a buckle latch that has a disc cut out for flush-mounted insignia of customer or manufacturer is offered by **Air Associates, Inc.**

Designated M-7500, the belt is offered in five colors: dark blue, dark green, beige, gray and tan. It is of the adjustable, two-inch-wide type that meets all CAA specifications.

Circle No. 156 on Reader Service Card.

SWIVEL JOINT



The **Weatherhead Co.'s Aviation Division** offers pressure-balanced, low torque swivel joints designated the Roto-Mite series.

Designed for all aircraft applications, these swivels accommodate a wide range of contents through anticipated high or low temperature and pressure extremes. Their simplified design eliminates the need for bearings or other anti-friction parts, the manufacturer says. Several stocked assemblies can be selected and snapped together to suit

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General Mills Flight Recorder eliminates expensive plane inspections

Structural inspections that prove to have been unnecessary are a thing of the past! With General Mills Flight Recorders on your planes, you can safely order such inspections only when the Recorder indicates unusual turbulence or extremely hard landings. The Recorder gives you a complete, accurate record of flight conditions. It eliminates guesswork, keeps your planes in the air earning revenue instead of undergoing needless inspections.

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☐ Records altitude, airspeed, vertical acceleration and direction of flight. ☐ The flight record is protected to withstand 2,000°F heat for a half hour, shocks up to 100 G. ☐ Weight is about half that of other commercial recorders measuring the same functions. ☐ Recorder continues to operate for a minimum of 10 minutes following power failure. ☐ No electronics—provides reliable results with a minimum of maintenance. ☐ Inscribes a continuous 300-hour recording on aluminum foil—a direct, permanent record that requires no photographic processing or magnetic playback. ☐ No special remote sensing pickups required.

FULL DETAILS on the General Mills Flight Recorder will be gladly sent on request. Write, wire or phone: Sales Dept., Mechanical Division of General Mills, 1620 Central Avenue, Minneapolis 13, Minn. STerling 9-8811.

MECHANICAL DIVISION OF General Mills, Inc.

Circle No. 16 on Reader Service Card.

NEW PRODUCTS

various installation and mounting arrangements.

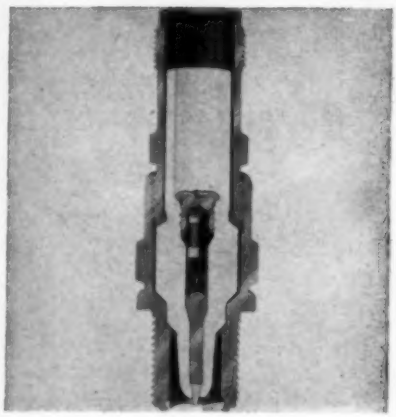
Circle No. 153 on Reader Service Card.

WIRE-LEAD RESISTOR

A wire lead wire-wound resistor encapsulated in a transparent material has been developed by **Shallite, Inc.** Visibility of the wire-wound element is said to aid in pre-detection of failure caused by bubbles or strains. According to the manufacturer, the resistor exceeds the requirements of government specification MIL-R-93A.

Circle No. 154 on Reader Service Card.

SPARK PLUG



The **BG Corp.** offers a new platinum electrode spark plug, designated RB 39R, that has been approved by CAA for Pratt & Whitney's R4360, R2800 and R1830 series engines.

The RB 39R features a new anti-fouling ceramic core design, an "all-weather" top that seals the spark plug barrel against the entrance of dirt and moisture from the ignition lead, as well as sealing the barrel at approximately sea level pressure, and a new ground electrode designed for long life.

Circle No. 155 on Reader Service Card.

SERVO MOTORS

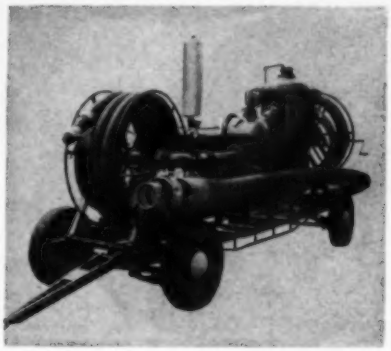
Production of servo motors of a new type of construction said to provide substantial weight reductions and increased cooling efficiency has been announced by **G-M Laboratories, Inc.,** Components Manufacturing Division.

The motors are available in three standard sizes, 11, 15 and 18, as well as in custom-designed sizes. In Size 18, largest of the three, a weight saving of three ounces has been effected. Normal operation is at an ambient temperature of 125° C. If desired, the power input to the fixed phase can often be increased without altering normal control phase characteristics. This permits interchangeability with existing motors.

G-M servo motors can be provided to meet all MIL environmental specs, according to the maker.

Circle No. 167 on Reader Service Card.

FUELING SYSTEM



An aircraft fueling system on wheels has been designed and developed by the **Harman Equipment Co.** for Lockheed Aircraft Corp. and Lockheed Air Terminal.

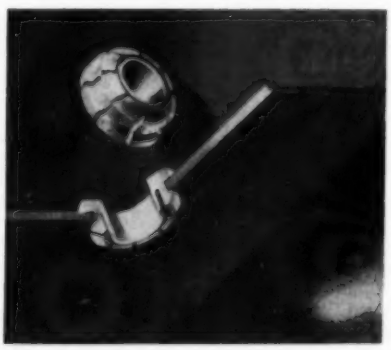
This system, called Fuel-A-Plane, permits the operator to test the single-point fuel manifold system of either new or repaired aircraft at low pressures and flow rates, without danger to the manifold or fuel tanks in case of malfunction of any part.

If the system checks out satisfactorily, a flip of the regulator and flow control lever brings pressures and flow rate to the maximum required for normal fueling operations.

The Fuel-A-Plane is equipped with filter, air eliminator, drippage and expansion pressure relief receptacle, fuel flow meter and static bonding cable reel. It also has a diesel engine-driven pump, air compressor, exhaust silencer, fuel hose reels and vacuum and pressure gauges.

Circle No. 157 on Reader Service Card.

'NON-ABRASIVE' GROMMETS



Shamban Engineering Co. offers a new series of one-piece grommets for use in adverse physical and chemical environments.

Designed for use in aircraft and

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AiResearch is looking for your kind of engineer. Through the efforts of engineers like yourself our company has become a leader in many outstanding aircraft accessory fields. Among them are: air-conditioning and pressurization, heat transfer, pneumatic valves and controls, electric and electronic controls, and the rapidly expanding field of small turbomachinery. AiResearch is also applying this engineering skill to the vitally important missile accessory field.

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Positions are now open for aerodynamicists... mechanical engineers... physicists... specialists in engineering mechanics... electrical engineers ...electronics engineers.

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AiResearch actuators are available for every possible aircraft requirement. You can depend on them and on all other aircraft accessories manufactured by AiResearch.

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SEEKING THE CHALLENGING PROJECTS IN

GUIDED MISSILE DESIGN

DESIGN ENGINEERS are offered unequalled opportunities at Convair in beautiful San Diego, California, in component and systems design within these fields: propulsion, airframe, hydraulics, pneumatics, mechanisms, electronic packaging. These fields have created unusual openings for challenging work on projects that border on the forefront of engineering knowledge. Skilled design engineers are urgently needed now to find answers to engineering problems in areas where the handbooks have yet to be written.

CONVAIR offers you an imaginative, explorative, energetic engineering department to challenge your mind, your skills, and your abilities in solving the complex problems of vital, new, immediate and long-range programs. You will find salaries, facilities, engineering policies, educational opportunities and personal advantages excellent.

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A Division of General Dynamics Corporation

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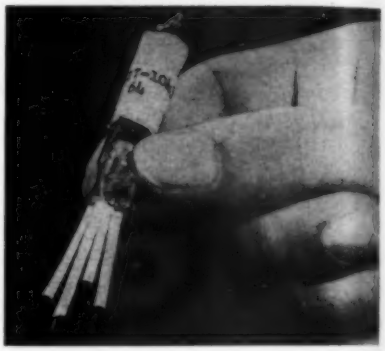
NEW PRODUCTS

electronic applications to guide cables and conduits through bulkheads, the grommets resist chemical action and heat. Designated S11154, they are available in either teflon or nylon which provide smooth rounded edges that minimize abrasion and extend service life of cables and conduits.

Circle No. 164 on Reader Service Card.

PROTECTION RELAY



A new over-voltage protection relay said to be virtually "environment-free" has been developed by **Jack & Heintz, Inc.**

Patterned after a fluorescent tube starter, the J & H relay can handle ac and dc power simultaneously. This ability eliminates the need for rectifiers, which are required to operate conventional over-voltage relays.

In the J & H relay, a hollow metal cylinder is used for the cathode. A wire anode is contained inside the cylinder. Two arched metal contact straps are mechanically secured to the cathode, but electrically isolated. A contact ring is attached to one strap for contacting the other strap when operation is required.

Circle No. 158 on Reader Service Card.

REMOTE CONTROLS

Teleflex Inc. mechanical remote controls feature a special push-pull cable with a helical outer wrap that provides teeth to engage hobbed wheels wherever it is necessary to rotate a shaft through a full revolution or more.

These controls were shown early this month at the National Aircraft Show in Philadelphia.

Circle No. 170 on Reader Service Card.

WOVEN HEAT ELEMENTS

Woven heat elements made by **Safeway Heat Elements, Inc.** are said to have many uses in the aircraft industry.

Heat elements insulated with Neoprene rubber may be used for de-icing

AIR FRANCE

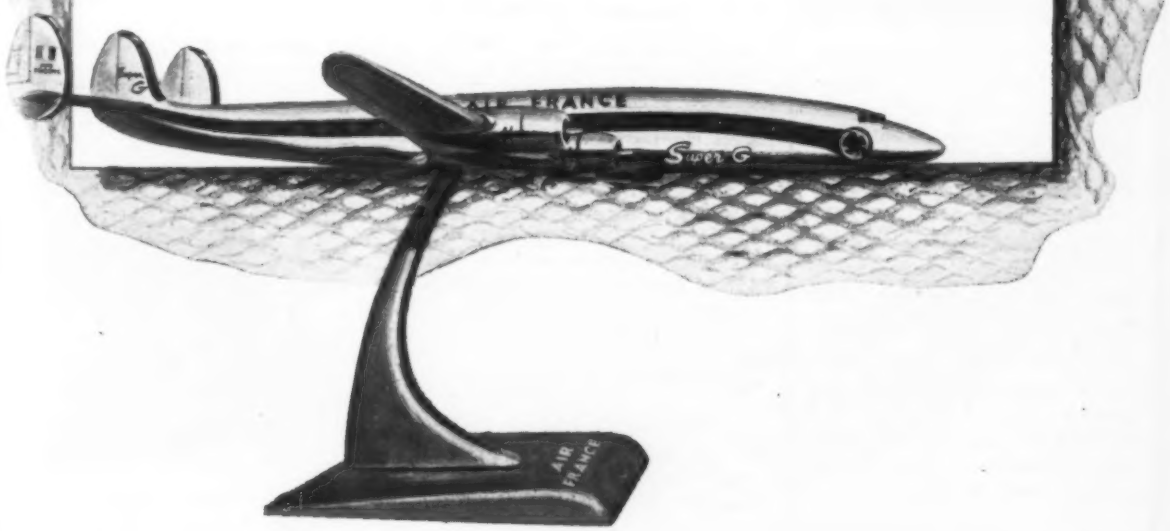
THE WORD'S LARGEST AIRLINE

683 FIFTH AVENUE • NEW YORK CITY

An Open Letter to American Flag Carriers

Year in and year out, you are the best customers for the world wide Air France network. This free flow of traffic between Air France and American Flag Carriers is indeed gratifying. We wish to express our warm thanks for your business and for your confidence in the dependability of Air France Services. We assure you that in the future, as in the past, the high standards of Air France will be maintained. We pledge continuing cooperation in realizing our common ideal of "one world" of travel.

Henri J. Lesieur
General Manager
North, Central American
and Caribbean Division



Look to GYROMECHANISMS, INC.

FOR THE LATEST ADVANCES IN:

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- POTENTIOMETERS
- MAGNETIC AMPLIFIERS

Write for Catalog and specific information

GYROMECHANISMS, INC.

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Designers and producers of precision potentiometers, gyros for all purposes, and magnetic amplifiers.

Circle No. 19 on Reader Service Card.

WHAT IS "THE FIRST ORDER OF BUSINESS" *every day?*

Many must items in the day's business are set aside when the American Aviation DAILY arrives on the desk of a key executive in the industry. That's because the DAILY is first reading for aviation's leaders, ever since it began in 1939. The DAILY offers these leaders, and all others interested in aviation, up-to-the-moment information about every important event taking place AS IT HAPPENS.

For a sample copy, forward your request to Dept. B. American Aviation DAILY, (An American Aviation Publication) 1025 Vermont Avenue, N.W., Washington 5, D. C.

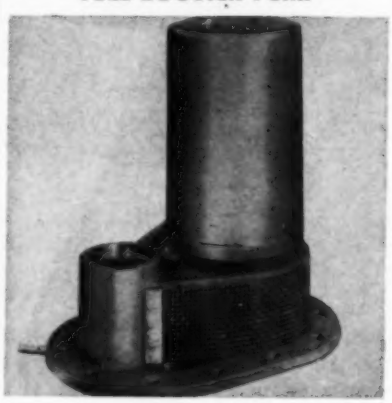
NEW PRODUCTS

propeller blades, helicopter rotors, aircraft wings and spinners, and for batteries, antennae and rocket tubes.

Neoprene's flexibility and resistance to erosion and weather are said to be ideally suited for conditions where medium heat (up to 200° F) is required. Silicone rubber is employed where higher heat is required. It is used in gyroscopes, Servomechanisms, temperature-sensing elements, and heater for missiles, molds and uhf antennae.

Circle No. 171 on Reader Service Card.

FUEL BOOSTER PUMP



Lear, Inc.'s Lear-Romec Division has announced an electric motor-driven centrifugal pump that is mounted totally submerged in an auxiliary tank that is dropped from the aircraft when empty.

Designated Model RG-11280-1, the pump is rated at 6,200 pph at 27.5 psi minimum discharge pressure, using jet engine fuel, as per MIL-F-5624. It has a continuous duty life of at least 200 hours, according to the maker.

Circle No. 159 on Reader Service Card.

GLAZING MATERIAL

Development of an electrically conductive transparent coating that prevents the formation of fog on the inner surface of aircraft windows and canopies has been announced by the **Sierracin Corp.**

Called Sierracote, the coating is also said to have the quality of reflecting up to 75% of solar heat rays. The manufacturer points out that the problem of fogging is becoming increasingly critical and that a transparent conductive coating offers many advantages over the cumbersome, heavy hot air system.

Circle No. 160 on Reader Service Card.

PRESSURE GAUGE TESTER

Amthor Testing Instrument Co. has announced three new and improved models of its dead-weight pressure gauge testers.

Models available are: type 460, capable of testing pressures up to 3,000 psi; type 452, recommended for ranges above 3,000 psi but not exceeding 6,000, and type 470, which has a capacity of 10,000 psi.

Accuracy of the testers is said to be within 1/10 of 1% of the indicated reading. All are portable, self-contained units.

Circle No. 161 on Reader Service Card.

CORROSION SHIELD

An exhaust gas corrosion shield to protect under-wing surfaces has been developed by **Coast Pro-Seal & Mfg. Co.** in cooperation with the **Douglas Aircraft Corp.**

Exhaust gases, especially from inboard engines, have long been a problem for maintenance crews because of the corrosive, metal-eating residues they leave on under surfaces of the wings. With Mylar shield, this problem is solved. Surface contamination is cleaned from the corroded area first. Then Mylar shield, .005 in. thick, is applied. Thereafter, according to Coast Pro-Seal, it is only necessary to wipe the Mylar sheets clean.

Mylar Kit #1 includes all necessary materials and detailed instructions.

Circle No. 166 on Reader Service Card.

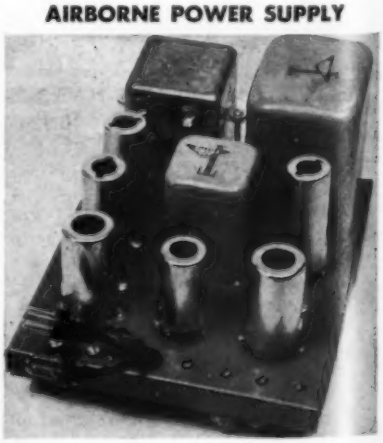
PRESSURE SWITCH

Aircraft Controls Division, Gorn Electric Co. offers a 4-oz. pressure switch that may be set to respond to hydraulic or pneumatic pressures of 100 to 12,500 psi.

The switch is applicable to control aircraft, missile and industrial systems and is adaptable to many mountings or envelope specifications. It is said to be capable of reliable performance under severe vibration, acceleration and adverse environmental conditions.

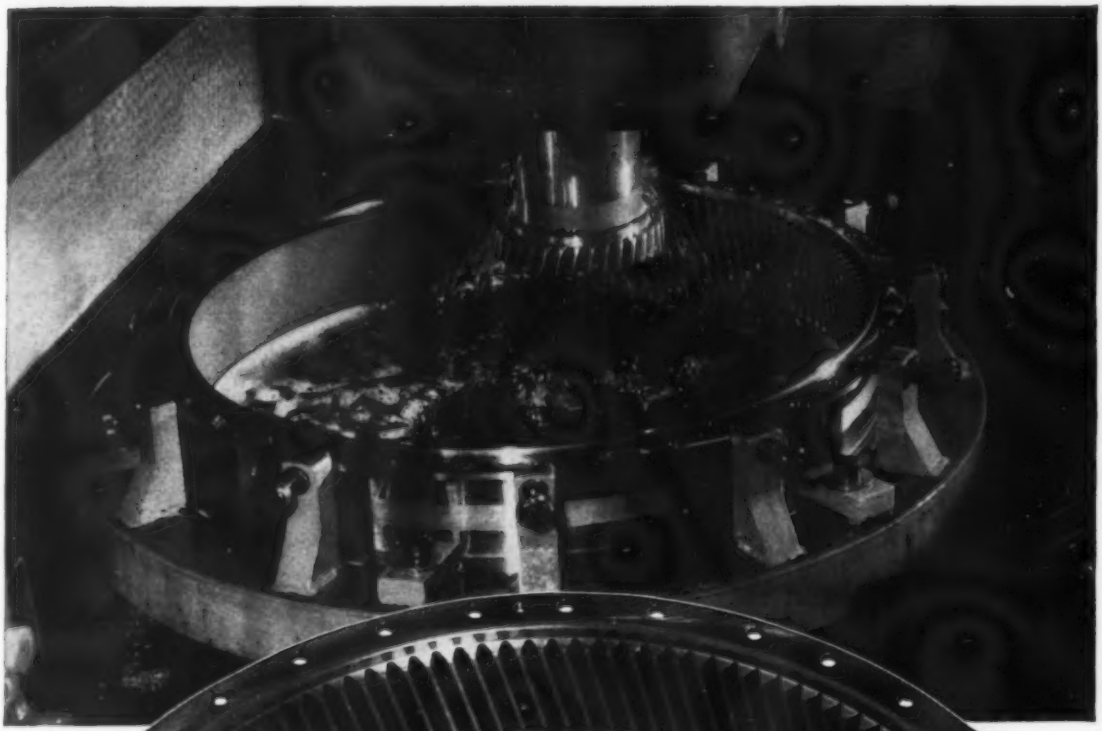
Circle No. 172 on Reader Service Card.

AIRBORNE POWER SUPPLY



An airborne power supply unit, designated Model XF1006, has been

and then we built



This 7 pitch, 19.1564″ pitch diameter internal gear for the Sikorsky S-58 Main Transmission

This HARD (Rockwell "50C") gear is cut after heat treating to master gear standards:

.0002″ per inch maximum lead error
+.0000 −.0003 involute error
.0002″ tooth spacing tolerance
60 RMS finish

INDIANA GEAR

INDIANA GEAR WORKS, INC. • INDIANAPOLIS, INDIANA

Circle No. 20 on Reader Service Card.

55 MILES SOUTHWEST OF NOWHERE–

Somewhere south of Chibougamau, in timber country, an ice-bound aircraft needed urgent help. The light ski-equipped aircraft had landed on the slushy ice of a small lake and had sunk until it rested on its wings. Helicopter airlift was the only means of salvaging the light plane from the forest-bordered lake.

Flying a Piasecki H-21 helicopter, the Royal Canadian Air Force went to the rescue. By means of an external sling, the H-21 gently eased the water-logged plane into the air and flew it to a nearby airfield. This is just one more unusual task well done by a Piasecki helicopter.

Unusual as well as conventional jobs are expected of the H-21. It is capable of carrying loads of over two tons and has been specifically designed to perform a wide variety of rugged military and commercial tasks.

The tandem rotor arrangement with its inherently powerful control system permits operation under many and varied conditions. Whether used for rescue work, troop transport or special tactical missions, Piasecki helicopters are recognized for their speed, range, lifting power and ease of maintenance.

This new carrier is another result of Piasecki's unceasing efforts to improve helicopter performance – to build helicopters to do more jobs and do them better than ever before.

ENGINEERS NEEDED FOR: DESIGN • AERODYNAMICS
TESTING • STRESS ANALYSIS • AIRFRAMES

Send resume to John Tannone, Jr., Employment Representative

FIRST IN TANDEM TRANSPORT HELICOPTERS

Piasecki HELICOPTER CORP.
MORTON, PENNSYLVANIA

Circle No. 21 on Reader Service Card.

NEW PRODUCTS

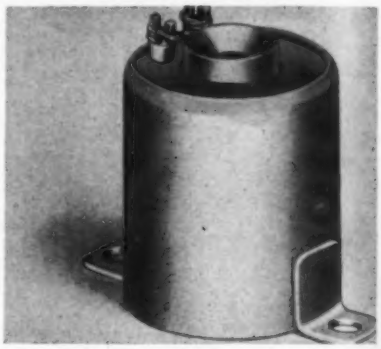
designed by Universal Electronics Co. for use in military aircraft.

The unit has an input of 105-125 volts ac at 400 cps and 100 volts dc at 40-60 milliamps. Especially adapted for integration into airborne laboratories where size is a primary consideration, the unit has six miniature tubes and a Type 85A2 reference tube. It uses hermetically sealed transformers to accommodate the temperature range specified, 120° F to —67° F.

Encased in a perforated aluminum housing, the unit shown here is bolted into place in an instrument panel for testing in the air.

Circle No. 163 on Reader Service Card.

WORK SOLENOID



Carruthers & Fernandez, Inc. has developed a miniaturized, single-coil solenoid for aircraft and guided missile applications that requires only five milliseconds to reach saturation in any altitude range.

Model 10-114 has been designed to meet applicable requirements of MIL S-4040 A. It has an ambient temperature range of —65° F to 200° F. The model illustrated can be internally pressurized at 3,000 psig and is designed for a life of 200,000 cycles.

Solenoids of all configurations for special applications are developed to customer specifications by Carruthers & Fernandez.

Circle No. 165 on Reader Service Card.

PORTABLE HEATER

American Air Filter Co., Inc. has announced that it will market a new portable heater this fall under the Herman Nelson trade name. According to the manufacturer, it will be the first indirect fired air heater in the low price field. It is expected to sell for less than $300.

Designated the Herman Nelson Thrifty, the unit is fired with ordinary fuel oil but will burn gasoline when outdoor temperatures fall below the "firing range" of fuel oils. Heating

capacity is manually controllable from 50,000 to 170,000 btu per hour.

Heated air is discharged under pressure by means of an electric motor-driven blower. Canvas ducts may be used to "spot" heat where desired.

Circle No. 174 on Reader Service Card.

GAUGING SYSTEM

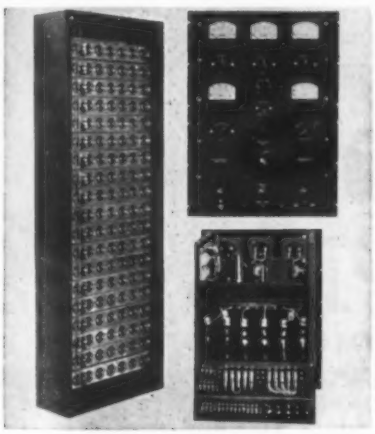
An electrical, transducer-type gauging system for measuring the contents of liquid oxygen converters in high-altitude military aircraft has been developed by the Aro Equipment Corp.

Basic elements of the system are a transducer and an indicator with a combined weight of 2 lbs. Using two watts of power and operating on a 28-volt dc circuit, the system provides crew members with a continuous sight reading of the amount of liquid oxygen remaining in a converter.

The transducer is connected to the converter by two short capillary tubes.

Circle No. 173 on Reader Service Card.

POWER SUPPLIES



A new group of high-current regulated power supplies that are said to exhibit the unusual characteristic of zero recovery time from a line or load transient have been developed by **NJE Corp.**

According to the manufacturer, they have been successfully used in aircraft-control applications, telemetering systems and computers.

In the zero-lag system, the principal objection to older methods of dc regulation is said to have been eliminated. Instead of the 200- to 500-millisecond time-lag between a step-change in line or load and the correction for it, in the zero-lag system the voltage never leaves the regulated region.

Illustrated is Model Z-33, 16-40 volts, 30 amperes, 0.5% regulation and 0.1% ripple.

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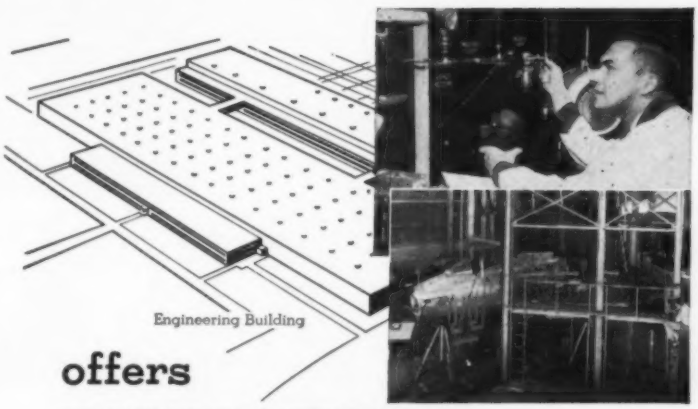
NORTH AMERICAN'S
Columbus Division



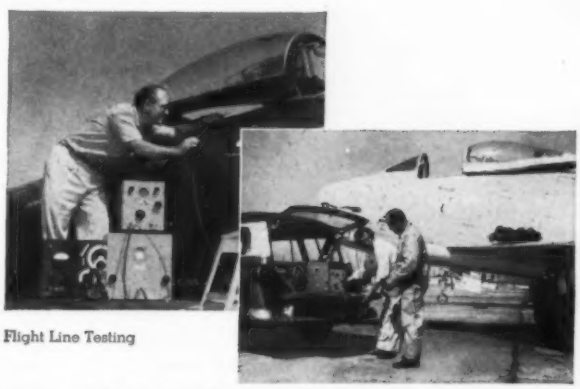
offers

ENGINEERS
complete design facilities in OHIO

Engineers at the Columbus Division of North American Aviation, utilizing the most modern test and development facilities, are achieving new design successes for the company that has built more airplanes than any other in the world. Included is the Navy's latest FURY JET, the FJ-4. Important, new airplane projects are in various stages of design and test.

HIGH OPPORTUNITIES FOR EXPERIENCED ENGINEERS: Aerodynamicists, Thermodynamicists, Dynamicists, Preliminary Design Engineers, Wind Tunnel Model Designers and Builders, Flight Test Engineers, Mechanical Engineers, Civil Engineers, Electrical Engineers, Aeronautical Engineers and many others.

Write, phone or wire collect for more information: Engineering Personnel, Department 56B, Columbus 16, Ohio Phone DOuglas 1851, Extension 875.



Flight Line Testing

Engineering Ahead for a Better Tomorrow

NORTH AMERICAN AVIATION, INC.

COLUMBUS DIVISION

OFFSHORE HELICOPTERS—Humble Oil Company's drilling projects in the Gulf of Mexico are being served by three new Sikorsky Aircraft S-55 helicopters. For over-water operations, the helicopters are equipped with special flotation gear. Dependable Sikorsky S-55s, which avoid the hazards of surface transportation, have proved to be highly successful carrying drilling crews, special personnel and equipment between the mainland and offshore rigs.

AROUND THE WORLD WITH SIKORSKY HELICOPTERS

SONAR DUNKER—Versatility of Sikorsky helicopters is again being demonstrated in the Atlantic, where Navy HO4S helicopters now perform anti-submarine missions. By dunking or trailing special sonar gear, the HO4S is prepared to make a major contribution to the job of finding and killing enemy submarines. This HO4S, with rotor blades folded, is pictured aboard the USS Leyte.

COPTERS FOR CANADA—Sikorsky HO4S helicopters are now serving with the Royal Canadian Navy. The first aircraft of an additional order of ten is pictured here during brief delivery ceremonies. Sikorsky helicopters, both military and commercial, are widely used in Canada. The dependable transportation they provide in a wide variety of jobs is especially important in Canada's wilderness areas.

H-34s AT WORK—New Sikorsky H-34 transport helicopters are now on the job at Army aviation centers. Here a group of 12 combat-equipped soldiers at Camp Rucker, Alabama, trains with one of the big helicopters, which are larger and more powerful than the widely-used Sikorsky H-19s. The new helicopters are also built as the Navy's anti-submarine HSS and will also be available as a 12-passenger commercial S-58.

HELICOPTER HISTORY:

FIRST ARMY FLIGHT OF THE VS-300

In July, 1940, the first Army pilot flew a Sikorsky helicopter. He was Capt. H. F. Gregory (now Brig. General), pictured here in the experimental VS-300.

This historic aircraft, America's first truly successful helicopter, led to the manufacture of Sikorsky R-4s, with which the Army Air Corps pioneered helicopter operations during World War II.

SIKORSKY AIRCRAFT
BRIDGEPORT, CONNECTICUT
One of the Divisions of United Aircraft Corporation

NEW PRODUCTS

PRESSURE SWITCHES

Southwestern Industries has developed a series of miniaturized differential and gauge pressure switches for aircraft and missile systems applications.

Designed to withstand vibration up to 35 gs, these pressure switches operate in inert gases and fluids, engine and hydraulic oils and aromatic fuels. Operating temperatures range from —65°F to 165°F.

Shown here is the Series 6300, which weighs 0.32 lbs., measures 2 in. long and 1½ in. in diameter, and has operating pressures of from 2 to 50 psi.

Circle No. 175 on Reader Service Card.

DIE CASTINGS

The Harvill Corp. offers to produce high-pressure, precision die castings in simple or complex shapes for commercial aircraft and electronics uses.

Die castings of aluminum, zinc, magnesium and copper-base alloys are cast to certified specifications under constant laboratory control. Also, as part of its die casting services, the company has a complete range of manufacturing services, including engineering, tool design and tool fabrication, machining, assembly and shipping.

Circle No. 168 on Reader Service Card.

TAPER-PIN RELAYS

Electro-Mechanical Specialties Co., Inc. has introduced a new series of hermetically sealed relays with taper pin terminals for solderless connection.

These relays, especially designed for use in jet aircraft, guided missiles and other airborne equipment, are available in two, three and four-pole models. They are said to surpass Mil. Specs. R-5757B and R-6106A.

Circle No. 176 on Reader Service Card.

MINIATURE AXIAL BLOWER

Globe Industries, Inc. has announced new miniature axial blowers for either ac or dc power. Its ac blower is a combination of the Globe type SC 400 or 60-cycle motor and an aluminum fan mounted in an aluminum housing. The dc blower makes use of the Globe type SS motor to give maximum performance in minimum size.

The blowers are available with air flow in either direction and also for operation on frequencies other than 400 cps.

Circle No. 177 on Reader Service Card.

SAMPLING SWITCH

A high-speed precision sampling switch with integral motor and planetray gear reduction is offered by Gen-

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WHAT CATEGORY OF AIRCRAFT ENGINEERING INTERESTS YOU?
...Nuclear, Operations Research, Electronics, Hydraulics, Flight Test, Design?
Lockheed's long range expansion program requires qualified Engineers in all functions.
If you are interested in becoming associated with this progressive Engineering Organization please contact us, in complete confidence, of course.
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761 PEACHTREE N. E., ATLANTA, GEORGIA
C130 ELECTRICAL CONTROLS TEST PANEL UNDER CONSTRUCTION

NEW PRODUCTS

eral Devices, Inc.

The switch is available with one, two or three concentric poles, with 60 contacts per pole. Connections to each pole are made by wire leads molded into the contact plate and attached to multi-pin connectors.

Circle No. 178 on Reader Service Card.

SOUND LEVEL METER

H. H. Scott, Inc. has announced a new, improved model of its 410 sound level meter, designated the 410-C, that features a separate output stage for driving sound analyzers, peak noise indicators, graphic level recorders and other equipment.

With the 410-C, there is no need to switch off the indicating meter movement to avoid distortion, according to the manufacturer. Circuit changes have also been made.

The meter is used for measuring noise, sound and vibration in aircraft and other applications.

Circle No. 179 on Reader Service Card.

FLEXIBLE HOSE

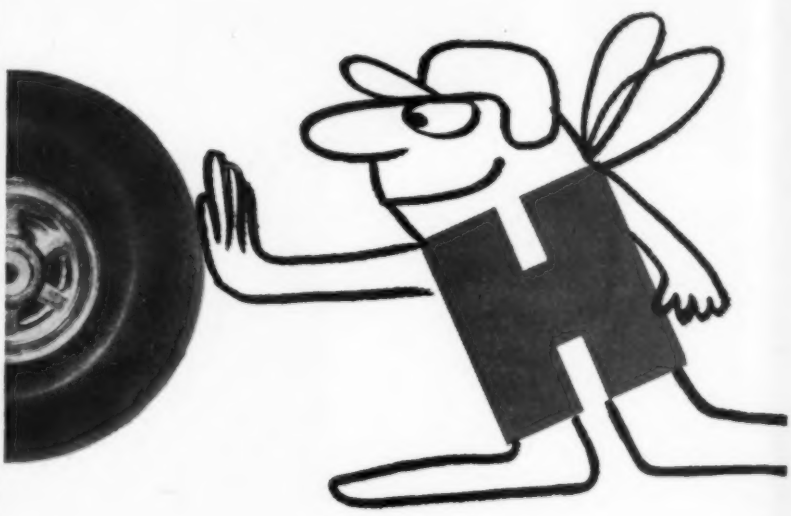
A new heat-and-corrosion-resistant flexible hose for jet engine plumbing has been announced by **Titeflex, Inc.** The inner core of the hose is made of Teflon (polytetrafluorethylene) a material that withstands high temperatures and is almost totally immune to chemical reaction from solvents and corrosive fluids.

A braid of stainless steel wire is formed directly on the inner core. Tests by independent laboratories, according to the manufacturer, have established that the hose fulfills the requirements of Mil. Spec. H-5511, which covers flexible hose used in fuel, hydraulic and lubrication lines of jet engines.

Circle No. 180 on Reader Service Card.

For more information about new products described in this section, circle numbers on the Reader Service Card in the front of the magazine.

Meet Hy Trol...



all-weather friend to pilots

Hytrol, Hydro-Aire's Anti Skid Braking System is not only a staunch friend for a pilot to have during any landing under tough conditions. It is a valuable standby to augment pilot control during landing runs under *any* conditions.

Hytrol gives the pilot power to reduce roll in rain, snow or ice to within 50 feet of required distance for dry conditions (C.A.A. tests). In addition, Hytrol is an obedient servant *always:* to keep landings straight and smooth; to get rid of lots of knots mighty quick and if you have to; and to cut down tire and brake maintenance.

Actually, you'll find Hy Trol a heck of a nice little guy to have around!

hytrol is Standard Equipment on: B-47, B-52, A3D, B-66, RF-84, F-100. Installations on: DC-4, DC-6, DC-7, C-46, C-54, C-97, C-118A C-130, B-377, R5D, R6D, P2V-5, F9F, F-80, F-89, F-101A, B-36G, YB-60.

every airplane that needs a runway needs *hytrol*

a product of

HYDRO-AIRE *Inc.* *who also make*
FUEL PUMPS • TURBO MACHINERY
FUEL VALVES • HOT AIR VALVES

BURBANK, CALIFORNIA • *Aviation Subsidiary of* CRANE CO.

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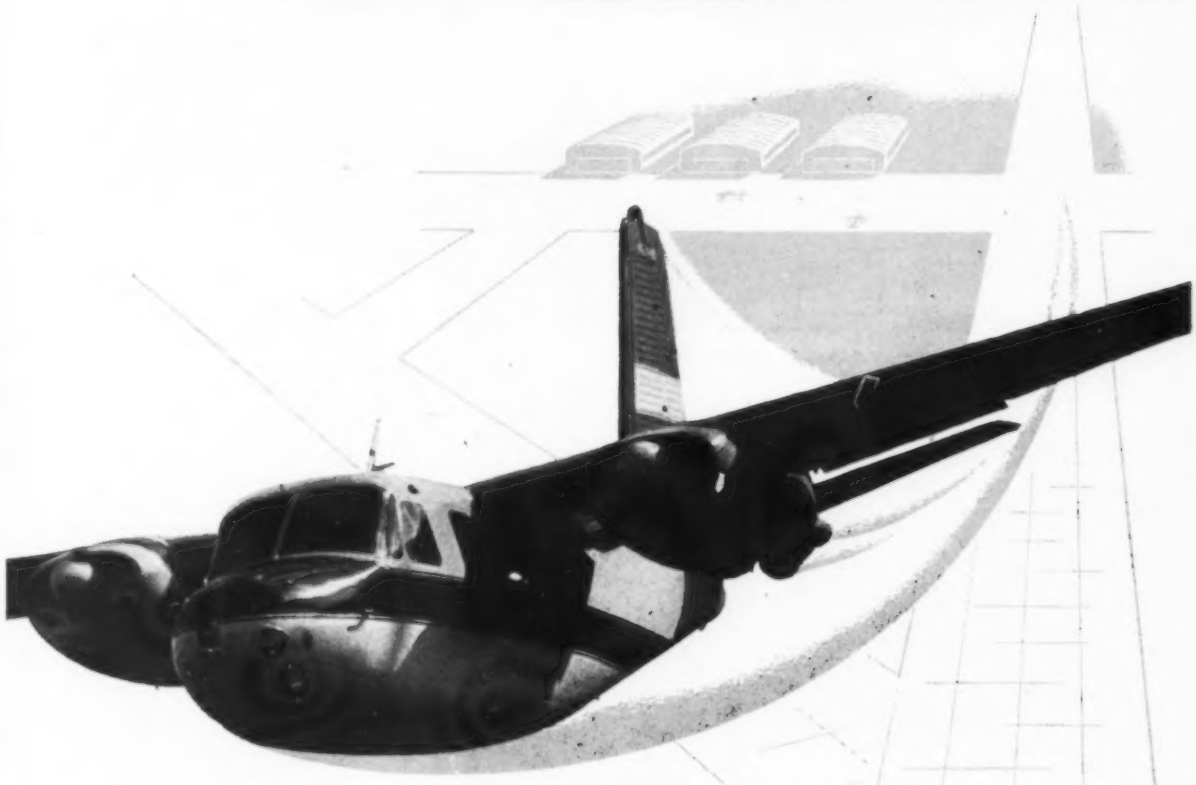
now Supercharged performance



MORE SPEED—230 m.p.h. @ 70% power (260 m.p.h. maximum). **MORE RANGE**—1400 miles normal range (1600 miles maximum). **MORE LOAD**—7,000 lbs. gross (2750 lbs. usable). These are but three of the outstanding features in the new supercharged

AERO Commander -680- Super

For complete information see your nearest Aero Commander distributor or write for Catalog 129-S

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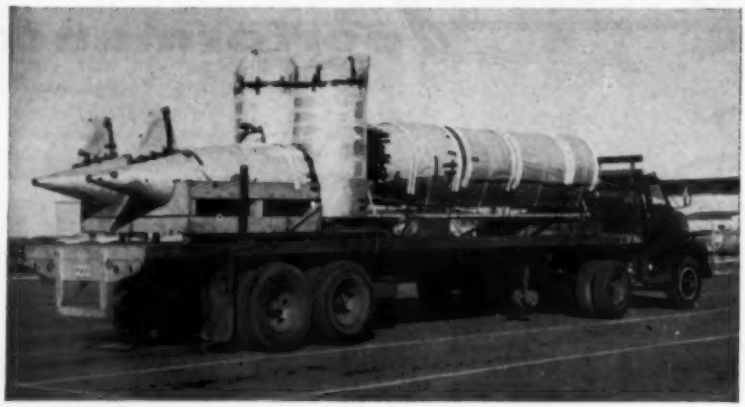
Maintenance Bulletin Board



NEW PACKING AND SHIPPING techniques developed by Northrop Aircraft, Inc. for transporting major F-89D assemblies to its Palmdale, Calif. delivery facility will save an estimated $80,000 annually. Northrop now uses a special Fruehauf trailer, and new shipping crates enclose Scorpion parts in damage preventative fixtures. They displace the old method in which openings of all components had to be individually sealed against dust and damage for "open" shipment by trailer.

CAA-Industry Tests Under Way To Find New Stratocruiser Prop

First step in a CAA-industry program to find a new propeller for Boeing 377 airline transports was completed last month as vibration and engine cooling tests got under way on a Hamilton Standard design using solid aluminum blades.

Results are still being examined "with a fine tooth comb," one CAA official said, but preliminary indications are that it will be a satisfactory replacement.

Preliminary results showed that cooling was slightly over limits, but it is felt that this condition can be alleviated by addition of blade cuffs. Vibration data also indicated need for a slight redistribution of blade mass in the final design.

Program to replace Stratocruiser propellers developed after the March 26 ditching of a Pan American B-377 off the Oregon coast. Loss of a propeller in that incident, coupled with results of investigations of six other incidents, led to a recent decision by CAA that hollow steel blades now used should be removed from service.

• **CAA Administrator Fred B. Lee,** in letters to presidents of Pan American World Airways and Northwest Airlines, urged replacement of the steel blades with solid aluminum assemblies "at the earliest possible time" consistent with the ability of the manufacturer to supply a replacement.

Since that time, however, CAA has "toned down" its stipulation of solid metal blades and is now insisting only on a replacement blade design that is less sensitive to cracks from minor abrasion and manufacturing defects than current models.

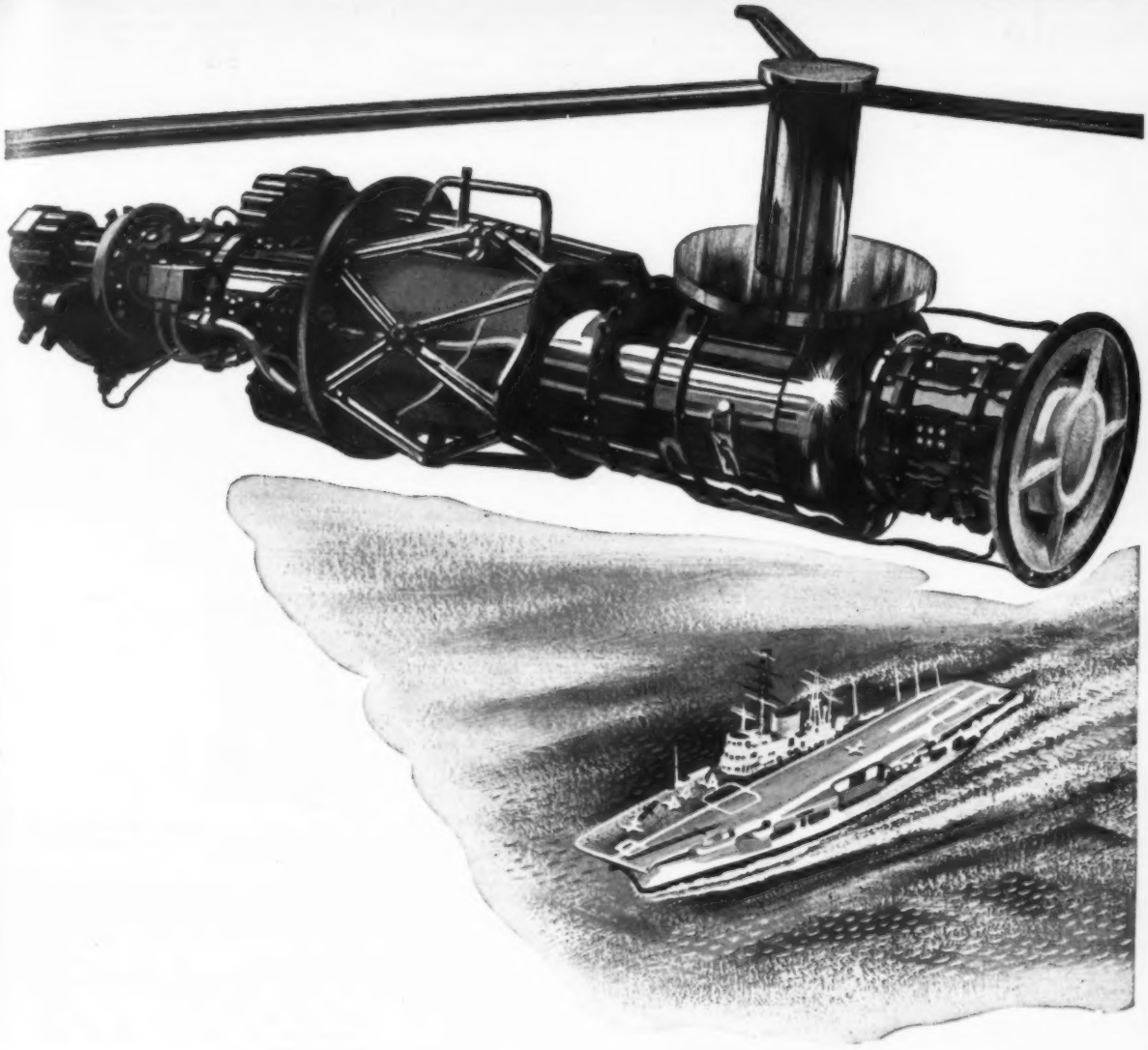
One carrier, reportedly Pan American, has since indicated to CAA that it will cooperate in the program.

CAA recommendation has also been relayed to British Overseas Airways Corp., second only to PAA as a Stratocruiser operator, through the British Air Registration Board. ARB secretary R. E. Hardingham has since informed CAA that he agrees with its recommendation and proposes to start immediate talks with BOAC to decide its position on aircraft equipped with this propeller.

• **Plan now** is to follow the initial vibration and cooling tests with performance evaluation of a Stratocruiser fitted with four new propellers, CAA said. Production of the new design by Hamilton Standard would then hinge on the outcome.

Assuming the test project proceeds smoothly, CAA expects it would still be nine months to a year before fleet installations could start. In the interim, it told carriers that special maintenance and inspection procedures set up after the PAA accident should be diligently followed.

NEW LOOK in Lockheed 1049G Constellation nacelle (above) features redesigned carburetor airscoop and addition of propeller afterbody to raise aircraft's critical altitude and increase speed. Old design is shown below.



The heart of a good helicopter

A helicopter engine that works without driving shafts and driving gear—that's the Napier Oryx. It's a 750 gas h.p. turbo-gas-generator, designed for helicopters propelled by jet reaction at the rotor blade tips. It weighs less, it's less complex and it's easier to maintain than conventional helicopter power systems. The Oryx is a step forward—and upward—in helicopter propulsion, and an engine of great importance to helicopter operators.

NAPIER **Oryx** turbo gas generator

D. NAPIER AND SON LIMITED · LONDON · W.3.

Partners in Progress with The ENGLISH ELECTRIC Company Ltd.

CBC 04

People

MANUFACTURING

Reid

Gage

C. E. Reid appointed small business liaison officer for Republic Aviation Corp.

James R. Gage moved up to newly-created post of military relations mgr. for Douglas Aircraft Co.'s Long Beach division.; **J. J. Wilker** appointed military sales mgr.

Alexander F. Mannella named general superintendent of Hamilton Standard division of United Aircraft Corp.

Wm. M. Burr to head up the new aircraft and missile section of Control Engineering Co.

Rear Adm. Harry B. Temple (USN, ret.) named assistant vice president of Robertshaw-Fulton Controls Co.

Charles Sopchak joined the technical staff of Consolidated Diesel Electric Corp.

Glen P. Bieging appointed mgr. of marketing research and product planning for General Electric heavy military electronic equipment dept.; **Charles D. Brown** made mgr. of sales light military electronic equipment dept.

Hubert J. Thomiszer appointed mgr. of Magnilastic div. and **Earl Washburn,** mgr. of Electronic Systems div. of Cook Electric Co.

Rudolph F. Gagg named group-executive-staff engineer for the eastern divisions of Bendix Aviation Corp.

Kennett W. Patrick appointed director of Transducer div., Consolidated Engineering Corp.

Roy C. Heacock made director of engineering of Axelson Mfg. Co.

John H. Sidebottom elected vice president of Flight Refueling, Inc.

L. E. Tollefson named Washington representative of Douglas Aircraft Co., succeeding **George B. Gelly,** who returns to Santa Monica. **Edward Curtis** moves up to director of contracts succeeding Tollefson. **S. W. Cebuhar** will replace **H. E. Hjorth,** also of the Washington office, who returns to Santa Monica as asst. chief project engineer on the DC-8 project.

Jack S. White is new manager of the eastern department of United States Aviation Underwriters, Inc. **J. Franklin Marra** is assistant manager.

Douglas L. Cochran appointed vp in charge of sales for Resin Industries, Inc.

Gordon W. MacKinney promoted to post of asst. to gen. mgr. and **Robert J. McMinn** to that of manager, contract and order dept., Propeller div., Curtiss-Wright Corp.

Harry B. Horne, Jr., named asst. to vice president of Piasecki Helicopter Corp.

Col. Willard W. Millikan (USAF-ANG) appointed asst. Washington representative for Northrop Aircraft, Inc.

Lt. Col. Walter Howard Niles appointed vice president of sales of East Coast Aeronautics, Inc.

J. W. Clutter, Lockheed Aircraft Service, Inc.'s gen. sales mgr. at Burbank moves to Idlewild, N. Y., as the company's acting base mgr.

John H. Quinn, Jr., joined Temco Aircraft Corp. as chief of technical services.

Cessna Aircraft Co. announced the incorporation of the National Aero Finance Co., Inc., a wholly owned subsidiary, with the following officers: **F. A. Boettger,** president; **Edwin D. Chase,** vice president; **R. G. Largent,** secretary-treasurer.

Ray D. Gardner named project engineer on Northrop Aircraft, Inc.'s Phase I long-range interceptor contract.

W. H. Jaeger appointed chief industrial engineer of the Propulsion Center, North American Aviation.

John W. (Jack) Frazier named staff asst. to the president for engineering and research and development, Bill Jack Scientific Instrument Co.

AIRLINE

Neff

William J. Neff promoted to manager of Trans World Airlines' base facilities planning at Kansas City, succeeding **J. T. (Jim) Davis,** who resigned to join Clayton Manufacturing Co., El Monte, Calif.

Everett M. Goulard named vp-industrial relations of Pan American World Airways.

Mauricio Soares appointed special representative of VARIG Airlines of Brazil for the United States, Europe and the Caribbean, with offices in New York City.

David Watson resigned as vice president and treasurer of Hawaiian Airlines to take position as asst. to the president on financial affairs, Honolulu Iron Works Co.

Ann W. Wood promoted to special assistant to the president of Northeast Airlines.

John F. Nycum appointed to newly created position of mgr. of flight equipment development, Delta Air Lines.

Peter R. Ossendorf appointed Mid-West regional mgr. for Lufthansa German Airlines.

Eugene S. Carrara named mgr. of industrial relations for North Central American and Caribbean division of Air France.

GOVERNMENT

Floyd S. Bryant appointed special assistant to the Secretary of Defense.

James E. Gorham, chief of CAB's routes and carrier relations div., has advised top Board officials that he will resign in the near future.

Maj. Gen. Ernest Moore, chief of staff for the Military Air Transport Service, designated MATS' vice commander; he will retain post of chief of staff.

Henry Aaron, former CAA chief of airports technical branch, named highway and airport engineer Wire Reinforcement Institute, Washington, D. C.

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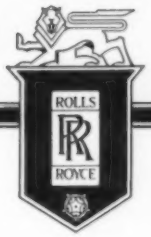

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West Coast Talk . . . By Fred S. Hunter

- **DC-8 power problem puzzler for Douglas.**
- **Augmented J57 engine behind schedule.**

IT HAS BECOME an open secret in Santa Monica that Douglas is confronted with a perplexing DC-8 power problem. It has been re-evaluating all its performance data on the projected jet transport.

It will be recalled that last June when Douglas broke out so dramatically with its DC-8 go-ahead announcement, it spelled out plans for two versions, one a domestic model having a gross takeoff weight of 211,000 pounds, the other an overwater model to tip the beam at 257,000 pounds. The company reported it would be ready for airline deliveries in 1959.

Hunter

At that time, there was no hint of any timetable differences between the two versions. Now, however, it seems the augmented J57 engine Douglas was counting on for its long-range, overwater model won't be ready until a year or more later than a less-augmented J57 suitable for the domestic version. This would put the start of deliveries on an overwater DC-8 back to 1960. And by that time—who knows?—a commercial version of P&W's new, higher-thrust J75 might very well be pushing into the picture.

No augmentation would be required for the J75. On the other hand, it is a heavier engine. Also, it will be more expensive. Douglas currently prices the J57-powered domestic DC-8 at $4,600,000, the overwater model at $4,650,000. With J75s, the overwater version's price would have to be increased about $300,000.

• •

The J57 complication centers around the necessity for extensive water augmentation to up the takeoff thrust if these big jet transports, like the Boeing 707 and the Douglas DC-8, are to be capable of operating long-range without throwing away all the payload. Latest reports from Seattle say Boeing is allowing for 450 gallons of water for thrust augmentation for the 707.

Information from Santa Monica indicates Douglas contemplates a somewhat lesser quantity for the domestic DC-8, but substantially more for its overwater model. Extensive augmentation like this compounds the troubles of the engine-maker. It adds to the engine durability problem. To illustrate, 39 gallons of fluid fills the water injection needs of the Douglas DC-6B. A 22-gallon tank suffices for Convair's twin-engine 440. It's a big step up to 450 gallons and more.

• •

All this has an important bearing on an important customer—Pan American. Word has been about for some time that Juan Trippe, PAA president, has had his contract-signing fountain pen all filled and the cap off, ready to sign on the dotted line for 25 planes. But not for deliveries a year or more behind a domestic carrier or for an airplane possibly having less performance than a competitor. Thus the predicament as Boeing and Douglas jockey for key customers in the two markets.

In a similar quandary, incidentally, is Convair on its Model 18 design for TWA, which has to have aircraft suitable for transatlantic as well as domestic schedules. There are even hints from San Diego that Convair may decide its best course is to bow clear out, at least for now.

• •

P&W's J75 is programmed into both Convair's F-102B and North American's F-107 . . . Motorola's Phoenix plant is second source on new guidance system for the Navy Terrier . . . Designation for the new Nike is Nike B (not Nike 2) but the original design is simply the Nike, not Nike 1 . . . Wonder if it is true the Institute of the Aeronautical Sciences actually is considering building an office building on the back lot of its Los Angeles facility to lease to aviation firms and allied interests in the area?

• •

McCulloch Motors bought a Super 18 Beech from Norman Larson, its first venture in an executive aircraft . . . Southern California section, with more than 500 members, is the largest unit in the American Rocket Society . . .

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QUIETEST, MOST LUXURIOUS, LONG-RANGE AIRLINERS IN THE WORLD!

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As you stroll through the spacious cabins, you'll see the widest, roomiest lounge chairs in any U.S. airliner; glare-free picture windows; rich wood-paneled interiors ...much, much more. Mealtime finds you lingering over each tempting course of a complete de luxe dinner. Between meals enjoy delicious snacks or tempting canapés from TWA's galley. And all this is yours at no extra cost!

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TRANS WORLD AIRLINES

U.S.A.·EUROPE·AFRICA·ASIA

International Aviation

By Anthony Vandyk

"Air defense has been perhaps the major area of weakness of NATO," says President Eisenhower's report to Congress on operations under the Mutual Security Program for the first half of 1955. There is little evidence to show that the situation has improved since the report was written.

The "more than 6,000 modern fighting planes" mentioned in the report do not add up to a coordinated, efficient fighting force.

Although swept-wing F-86s and F-84Fs are now beginning to reach some of the continental European air forces, the core of the European NATO air defense forces still comprises straight-wing models in varying states of obsolescence.

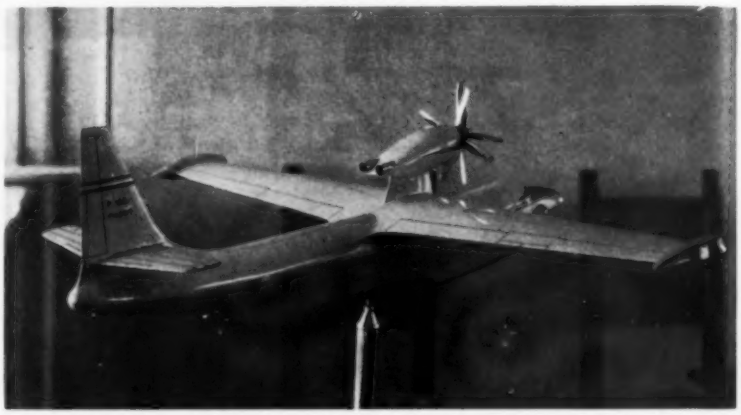
• **Taking the European nations** alphabetically, **Belgium** comes first. Here the Gloster Meteor 8 is still the standard day fighter pending availability of the Hawker Hunter while the Meteor NF-11 is the standard all-weather fighter. Tactical support wings are using Republic F-84Es and Gs which soon will be replaced by Fs.

The equipment situation of **Denmark's** air arm is about the same as Belgium's. **France's** first-line fighters comprise the Dassault Ouragan and Mystere (mainly the former), SNCASE Mistral (Nene-powered version of the DH Vampire) and F-84Gs (being replaced by Fs.) The French Air Force's all-weather fighter is the Meteor NF11 and its replacement, the SNCASO Vautour, seems to be a long time away. **Greece** is fortunate in having some Canadair F-86s along with F-84Gs.

Italy has to rely on the F-84G and the Vampire pending availability of the F-86. Backbone of the **Netherlands'** air arm is the Meteor and the F-84G which are to be replaced respectively, by the Hunter (but not for some time) and the F-84F (soon). The Dutch Meteor NF11 all-weather fighters will soon be replaced by F-86Ks. **Norway** is currently receiving F-86Ks to supplement its F-84Gs. **Portugal's** only jet fighter is the F-84G. **Turkey's** first-line fighters comprise Canadair F-86s and F-84Gs.

Last, alphabetically, but first numerically, comes the **United Kingdom.** With the availability of the Hunter, the RAF is turning over its Canadair F-86s to other NATO nations. Mainstay of the RAF's fighter force at moment, however, is still the Meteor and the Venom. The all-weather Javelin is still some long time away from combat service.

Piaggio P.155 Flying Boat



ITALY'S PIAGGIO P.155 flying-boat/amphibian project may be fitted with two auxiliary turbojets so that speed may be boosted to 450 knots for a half-hour period. Main powerplant is a coupled turboprop unit.

West Germans Group to Make Planes

With orders from the West German government seemingly imminent, the West German aircraft industry is moving ahead with its program to get back into production. Latest development is the proposed establishment of two associations, one for northern Germany and the other for Southern Germany.

The northern group, which is reported to be planning license production of France's Nord 2501 Noratlas transport and Italy's Piaggio P.149 trainer, will include: Finanz-und-Verwaltungs-Gesellschaft Weser, Focke-Wulf Flugzeugbau, Hamburger Flugzeugbau (Blohm & Voss), Henschel & Sohn and Professor Blume's company.

The Southern Group which is said to be planning license production of the Dornier Do27 liaison aircraft and France's Magister jet trainer, will consist of: Dornier-Werke, Ernst Heinkel and Messerschmitt. It will be noted that all these firms are airframe companies—as yet no engine manufacturer has been slated for membership in either association.

Transport Briefs

Fred Olsen Air Transport, Norwegian independent, has ordered three Viscount 800s for delivery in the fall of 1957, bringing the total number of Viscounts on sale or on order to 239; Fred Olsen's two Viscount 700s have been leased to **British European Airways.** . . . **Iraqi Airways** plans to inaugurate two long-distance Viscount services next spring: Baghdad-Damascus-Beirut-Istanbul-Vienna-Paris-London and Baghdad-Basra-Kuwait-Bahrein-Karachi-Bombay . . . French counterpart of **Silver City Airways'** car ferry service between Britain and France is to be operated by a new French company, **Compagnie Francaise du Pont Aerien-Air Channel;** it will use Bristol 170s based at Le Touquet . . . **West African Airways** has ordered three more DH Herons, bringing its total order to eight; four are already in service.

KLM Royal Dutch Airlines will convert its fleet of Convair 340s to Model 440 Metropolitans; special kits will be supplied by Convair and the work will be carried out in KLM's shops at Schiphol airport, Amsterdam . . . **Scandinavian Airlines System** plans to be operating a daily service over its "polar" route to the U. S. west coast before the end of 1957 . . . **Qantas Empire Airways** will replace its Lockheed L-749 Constellations on the Sydney-Johannesburg run with L-1049 Super Connies on November 1 . . . **Air-India International** plans to extend its operations to Australia next year; initially there will be one flight weekly . . . **Deutsche Lufthansa** will open a twice-weekly Super Constellation service from Germany to Rio de Janeiro next year . . . **Swissair** hopes soon to be able to extend its Switzerland-South America service from Sao Paulo to Buenos Aires; plans are for schedules to be stepped up from once to twice weekly.

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Gaty, Beech Aircraft V. P., Receives Business Flight Safety Award

DETROIT—John P. Gaty, vice president and general manager of Beech Aircraft Company, was awarded the 1954 Annual Business Flight Safety Award, established this year by the Women's Aeronautical Association of Kansas, for "exceptional contribution to the promotion and advancement of business flying safety during 1954." A silver trophy was presented to Gaty at the opening night banquet of the National Business Aircraft Association's eighth annual meeting and forum in Detroit last week.

Gaty was chosen unanimously for the award, administered by the NBAA, by the special awards committee. Specifically cited in his nomination was the Beechcraft safety suggestion series and his safety campaign for the company's Bonanza. Merrill C. Meigs, vice president of the Hearst Corporation, made the presentation at the banquet which was presided over by Henry Boggess, NBAA president.

At the conclusion of the three-day session, 19 member organizations of NBAA and 69 first pilots received Meritorious Safety Awards for having flown business-owned aircraft one million miles and 500,000 miles, respectively, without accident or injury. Fifteen of the 69 pilots qualified as "Million-Milers."

Leading the list of member companies in number of accident-free miles was Monsanto Chemical Company with a total of 4,272,894 miles, followed by Burlington Industries with 3,188,961 and Great Lakes Carbon Corporation with 2,389,636. Others receiving safety certificates were: Columbia-Geneva Steel, 2,301,544; Ford Motor Company, 2,300,000; Southern Natural Gas Company, 2,147,989; Hercules Powder Company, 2,104,035; Corning Glass Works, 2,102,565; Gulf Oil Corporation, 1,810,380; International Paper Company, 1,658,714; Minneapolis-Honeywell Regulator Company, 1,424,000; Owens-Illinois Glass Company, 1,412,646; General Electric Company, 1,376,200; The Proctor & Gamble Company, 1,264,277; Shell Oil Company, 1,250,000; Anchor Hocking Glass Corporation, 1,232,200; Slick Enterprises, 1,114,000; Holley Carburetor Company, 1,080,326; and Thompson Products, inc., 1,020,000.

Nelson U. Rokes of The Proctor & Gamble Company led the 15 "Million-Milers" in the pilot safety award category with a total of 2,779,548 safe plane miles flown consecutively. John A. Lyon of Malco Refineries was second with 1,400,000 and B. Owen Mayfield of Hercules Powder Company was third with 1,318,900.

Other "Million-Milers" by numbers of miles flown: George E. Meyers, Monsanto Chemical Company, 1,120,000; William B. Hobson, Hercules Powder Company, 1,109,580; Wilfred R. Dotter, International Harvester Company, 1,107,000; Richard N. Thurston, Monsanto, 1,094,878; Norman L. Mitchell, Minneapolis Star and Tribune, 1,055,250; George C. Pomeroy, Swiflite Aircraft Corporation, 1,050,000; Raoul Castro, International Harvester, 1,040,000; Ralph E. Piper, Monsanto, 1,038,000; Harold J. Bowen, Corning Glass Works, 1,021,625; S. M. Maxwell, Burlington Industries, 1,020,744; Carl J. Lund, International Paper Company, 1,014,800; and Thomas J. Schuetz, International Harvester, 1,008,900.

Objectives of the annual NBAA safety awards were cited by Walter C. Pague, chairman of the awards committee as: "First, to focus public awareness on the remarkable safety records being established by business organizations operating aircraft and, second, to call attention to the tremendous growth of business flying throughout the United States.

Criteria for the awards, Pague said, are based on accident reporting standards established by the American Standards Association and the National Safety Council. • • •

Beech Gets 2nd Order For French Lightplane

Beech Aircraft Corporation has revealed that it has received a second firm order for the Morane-Saulnier MS-760 twin jet lightplane, on which it holds a license option to produce in the U.S. The order was placed by Trans-Oceanic Marine, Inc. through Beech distributor, Atlantic Aviation of Teterboro, N. J. The distributor has posted a $50,000 deposit.

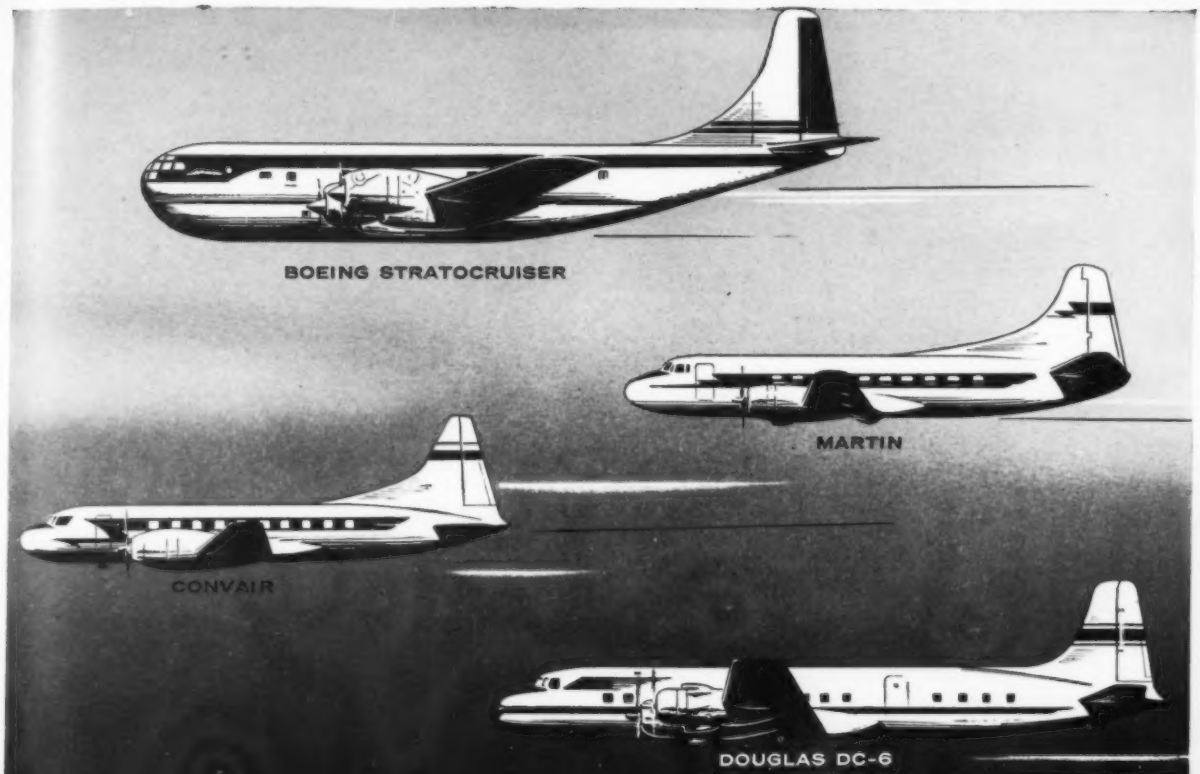
The first order with firm deposit was placed by the J. C. Reed Company of Houston, Texas, Beechcraft distributor. The second order, however, is the first received from a business firm for its own use. The 410-mph jet will sell for around $300,000.

Taylorcraft Announces Fiberglas Agriplane

A Fiberglas agricultural aircraft was recently announced by Taylorcraft, Inc. of Conway, Pa. with first production model delivered to Hall & Ward, distributor in Ventura, Calif. Designed primarily for dusting and spraying, the plane can be adapted to other uses including cargo, aerial patrol and can carry up to five people as a personnel carrier.

Christened "The Topper," the agriplane is powered by a Continental O-470-J 225 hp engine and has an allowable gross weight of 3,767 pounds. It can carry either a three-quarter ton load of solids or 200 gallons of liquid, according to the manufacturer. Conversion from solids to liquids is accomplished by two simple lever operations without the necessity of removing anything from the airplane. The wing design incorporates slotted wing tip, aileron and flaps.

The Topper is the second in a series of Fiberglas aircraft designed by Taylorcraft. The four-passenger Ranch Wagon business aircraft has been in production since October, 1954, and backlog of orders is reported at $500,000.



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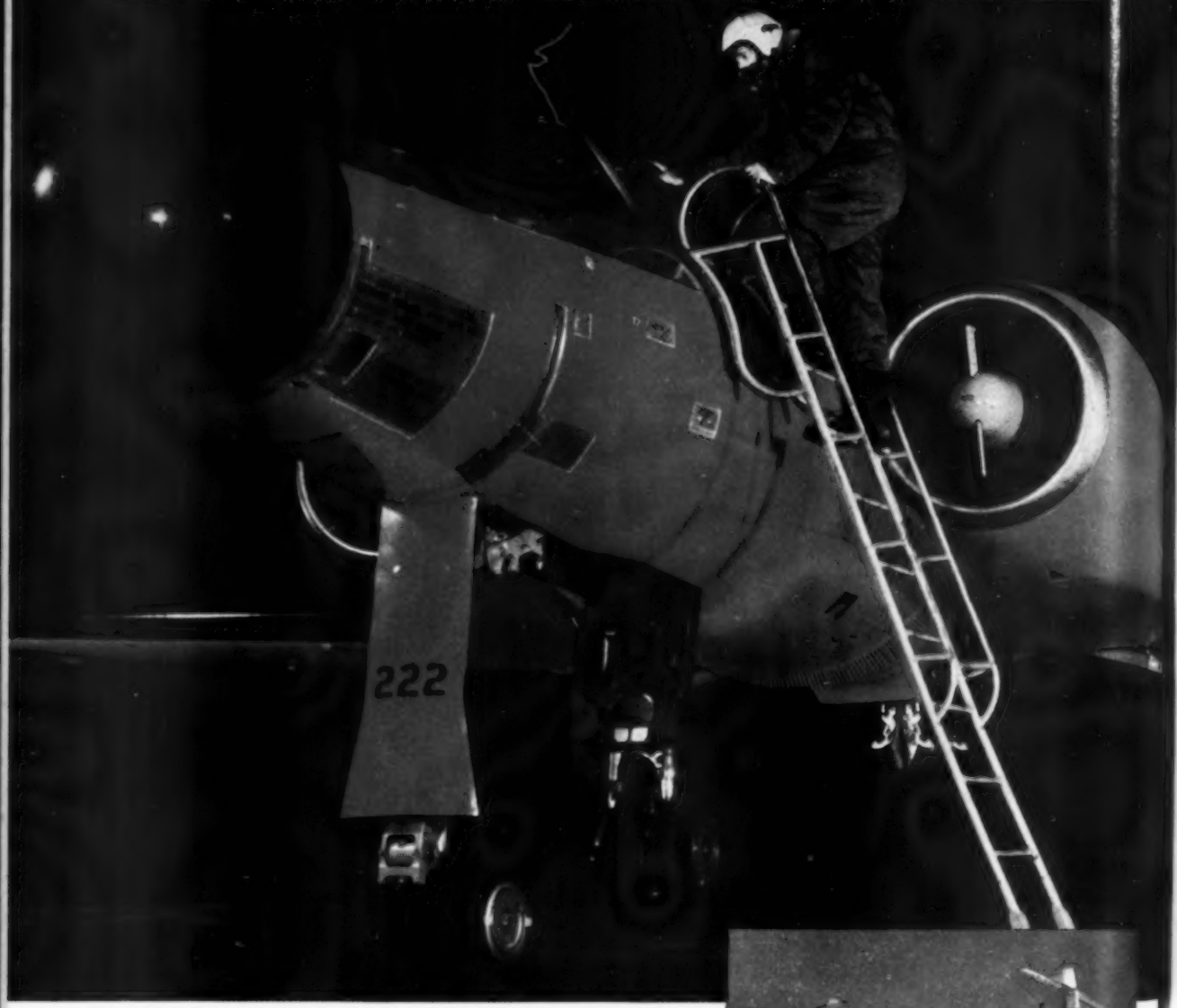

In RCAF operational multi-squadron service in Canada, squadrons of CF-100s will begin duty with NATO forces in Europe by 1956

DROGUE PILOT RIDES RED

To practice collision course interception—the new one-pass radar-controlled attack technique—the RCAF needed "something fast and high to shoot at". Avro Aircraft supplied modified CF-100s which tow specially designed drogues attached to 12,000 feet of cable. The planes are painted a vivid fluorescent red so they won't be mistaken for the target.

Practicing this new collision course attack or the grim business of repelling enemy planes, Avro Aircraft's CF-100s are the mainstay of Western Hemisphere defence. Men of the RCAF patrol Canada's northern approaches on a 'round-the-clock alert in these mighty all-weather night interceptors.

Avro Aircraft's CF-100s add deadly striking force to the air defences of the free world. No other all-weather night interceptor in service today can equal them for power and range.

AVRO AIRCRAFT LIMITED MALTON, CANADA

MEMBER; A. V. ROE CANADA LIMITED & THE HAWKER SIDDELEY GROUP

TRANSPORT TRENDS

Washington, D. C., Oct. 10, 1955

FIRST MAJOR BREAK in the battle among airlines for jet transport leadership is due late this month. W. A. Patterson, president of United Air Lines, disclosed in a recent Cleveland speech that UAL will place its jet order before November 1, a full 60 days sooner than the December 31 deadline for an order mentioned by Patterson several months ago.

United's announcement, once it comes, is expected to be followed closely by jet orders with the same producer by both American and Pan American. Eastern has already disclosed its $125-million budgeting for 20 jets and also can be expected to choose between the Boeing 707 and Douglas DC-8 about the same time.

BEGINNING NEXT YEAR, U.S. PLANE BUILDERS will have to satisfy a list of special conditions if they expect to export commercial transports to Great Britain. British Air Registration Board has informed CAA of the new requirements and that agency is preparing special instructions to its regions to implement them in 1957.

Main feature of the ARB stipulation is that U.S. manufacturers supply performance data and flight manuals based on its "rationalized" performance methods rather than the segmented style used in this country. ARB's list, however, also includes such items as added fire protection (crash inertia switches) and a stipulation that manufacturers supply fatigue strength data on any structural member where a single failure could be catastrophic.

TWO "NAME" CASES AGAINST NORTH AMERICAN AIRLINES, one upholding and the other opposing the nonsked group's use of its name, appear headed for simultaneous consideration by the U.S. Supreme Court.

Though victors some months ago in the U.S. Court of Appeals in Washington, D. C., in a case brought by CAB and American Airlines, the nonscheduled line lost another decision in the California courts recently to North American Aviation, Inc., the aircraft manufacturing firm.

Ninth Circuit Court of Appeals late last month unanimously upheld a lower court finding that North American Aviation has "sole and exclusive" right to its name in the aviation business, including air transport. It held the airline group was attempting to trade on the reputation and good will built up by the manufacturer.

American Airlines, which opposes the nonsked's use of the word "American" in its name, already has petitioned the Supreme Court to consider its appeal. North American Airlines, meanwhile, is expected to appeal the California decision to the highest court.

NOTWITHSTANDING ALL CURRENT APPEARANCES of solidity of the Civil Aeronautics Board, there is a strong likelihood of three membership changes within the next nine months. Although the only "scheduled" term expiration is that of member Josh Lee on December 31, prospects of two other changes are definitely in the picture.

DOMESTIC TRUNK AND LOCAL SERVICE AIRLINES boosted their total passengers carried to 20.8% of the nation's railroad traffic during the first half of 1955. Total passenger-miles flown was 85% of the total rail passenger-miles during the year. While the airlines passenger traffic was up 19.3% for the period compared with the same six months of 1954, rail traffic was down 3.5%.

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TWA Triggers Big Drive for Coach Market

- **First major airline to institute mixed-service on luxury planes.**
- **American objects to 'hurried maneuvers'; CAB weighs pros and cons.**

By WILLIAM V. HENZEY

COACH development in this country headed for another new horizon late last month when Trans World Airlines turned over one-third of the seats in its top luxury planes — the Super-G Consellations—to the expanding low-fare market.

And, said TWA, if the demand proves even greater than now anticipated, additional coach space on some or all of its 20 Super-Gs will be made available.

The planes, which in strict first-class service carry 64 seats plus lounge accommodations, are capable of an all-coach capacity of 89 seats.

• **In its first attempt** to use its No. 1 aircraft in coach service TWA is converting the aircraft to accommodate 20 coach passengers in the forward compartment (see diagrams). In transcontinental service, where five daily Super-G round-trips are offered (including 3 nonstops), available coach capacity will be increased by 25%, or to about 500 seats in each direction daily.

In addition, mixed-class Super-G service will be available on four other daily schedules serving Philadelphia, Pittsburgh, Chicago, St. Louis, Kansas City and Dayton.

The move marks the first time in domestic service that the two classes of traffic—coach and first-class—have been carried aboard the same aircraft although there has been fairly widespread use of the idea in international service.

• **Civil Aeronautics Board,** meanwhile, has taken an apparently cautious view of the development, although it refused to block TWA's tariff which went into effect September 25. Instead, the Board ordered an investigation to weigh formally the relative advantages and disadvantages of what TWA calls "multiple-service."

CAB was asked by American Airlines to suspend TWA's tariff. One reason cited was that the Board, in 1953, took a rather dim view of extensions of mixed-class service in the international field. American asked the Board not to countenance "hurried maneuvers" to introduce mixed-class service in this country.

Furthermore, American said, the idea may be rationalized as a "crass 'come-on' to the unsuspecting passenger" with TWA, possibly unable to accommodate the demand stimulated by Super-G coach advertising, shunting passengers to lesser coach equipment.

• **TWA answered** that it would meet the demand and that AA's argument wasn't that the proposal was unlawful but "if improperly applied, could become unlawful."

The issue presumably will be resolved in CAB's new investigation, but meanwhile, TWA is free to convert its 20 Super-Gs for the combination operations.

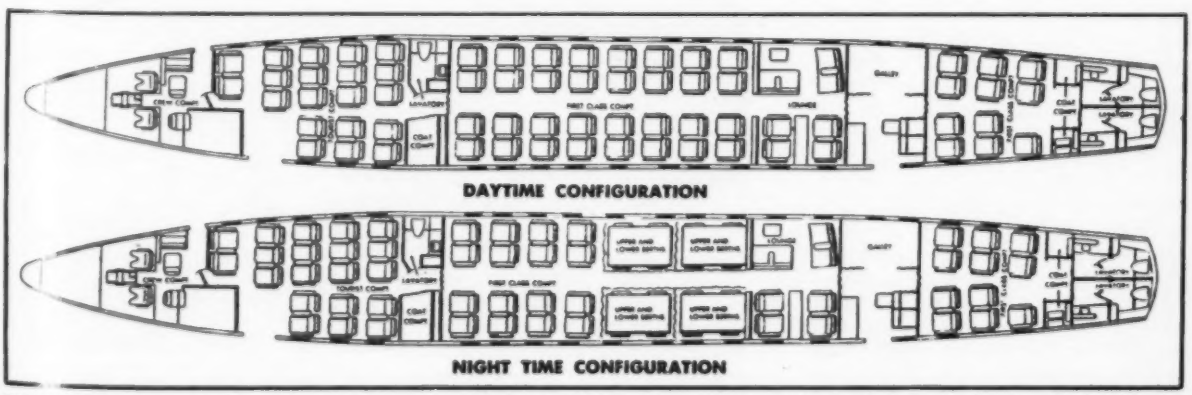
The mixed-class proposal was the second of three recent TWA innovations, all of which eventually will be combined in the drive for expanding markets. First such innovation was the new $80 transcontinental coach fare which, since Sept. 12, has applied on all transcontinental coach flights on Monday through Thursday each week for passengers buying round-trip tickets and completing their passage in 30 days.

First week's results of the $80 fare idea were promising. Total coach passenger-miles for that week for TWA were 20,367,801, or 10.6% over the comparable period in August, and 17% higher than the same 1954 period.

When the mixed-class service became available on Sept. 25, all coach fares, including the $80 fare, were good for front-section seats aboard the Super-Gs.

• **On November 1,** the third new idea will be placed in effect. It involves scheduling of Super-Gs from major west coast cities nonstop to New York and on to London and Frankfurt. It is TWA's first use of the Super-G in international service and the first such one-stop service from the U.S. west coast to Europe.

Since all Super-G aircraft will have a coach compartment, the $80 fare plus thrift season transatlantic fares will be available for low-cost, high-speed, California to Europe trips.



DIFFERENCE between daytime and night-time accommodations in TWA mixed-service Super Connies is shown in diagrams. Night plane has eight upper and lower sleeping berths. When these berths are in use, they leave space for only 27 first-class seats. Otherwise, there are 43 first class seats and 20 "Sky Tourist" seats available.

Early next year, the same planes will be scheduled to Paris, Rome, Athens, and Cairo.

• **Why the decided emphasis** on coach development even to using luxury aircraft? TWA's answer is twofold: 1. The promising potential of the low-fare market; and 2. The remarkably easy convertibility of the Super-G interior.

As for the potential market, TWA president Ralph S. Damon recently phrased his company's optimism this way: "The air tourist market today is the most rapidly growing segment of the total business. While I expect the first-class markets ten years from now will be greater than they are today, I think their increase will be limited to the conversion of the remaining surface-bound passengers plus the population travel growth, and that the tourist market is still relatively unlimited and may still increase some tenfold in the next decade."

Damon noted that the Department of Commerce estimates that the population growth of travellers in the next ten years will increase some 27 million people within the U.S., "all of whom from their early youth will be well conditioned to air travel."

"I think," he continued, "the conclusions we can draw are that we will have a relatively limited further growth in first class travel and an extremely heavy further growth in air tourist travel."

• **TWA's decision,** meanwhile, to utilize the Super-G's interior flexibility as a traffic stimulator, puts some new color in the aircraft manufacturing race the proudest participant of which, up to now, has been the one producing the fastest plane.

If TWA can, with its mixed-class service, produce as much revenue per plane-mile as its Douglas DC-7 competitors, it will obviously have offset whatever speed advantages may have been claimed by DC-7 operators.

The Super-G's front compartment can be easily isolated from the remainder of the aircraft and coach passengers utilizing that compartment will have a separate entrance, separate lavatory and generally less frills than first class passengers.

• **TWA says** competitors will find it more difficult and more costly to convert a section of their DC-7s for a mixed-class service.

Thus TWA is taking advantage of a characteristic peculiar to its top planes.

American's and United's officials, meanwhile, remain secretive about their expected counter-moves. Best guess, pending outcome of CAB's study of the mixed-class idea, still is that both AA and UAL will put DC-7s into a full coach operation.

FIRST TO FLY the 707 from the captain's seat on takeoff was Pan American's Scott Flower, asst. chief pilot-Atlantic Division. Flower was one of three PAA pilots checked out on the 707 recently.

ONLY FOREIGN AIRLINE representation came from KLM Royal Dutch Airlines. J. J. Bak (shown), Ron George and George Malouin evaluated the 707 for KLM.

Four Airline Teams Test Boeing 707

Step-up in airline interest in Boeing Airplane Co.'s prototype 707 jet transport prototype was evident in Seattle recently as pilots of four major domestic and foreign carriers flew the airplane on 27 flights totaling 10 hours and 18 minutes.

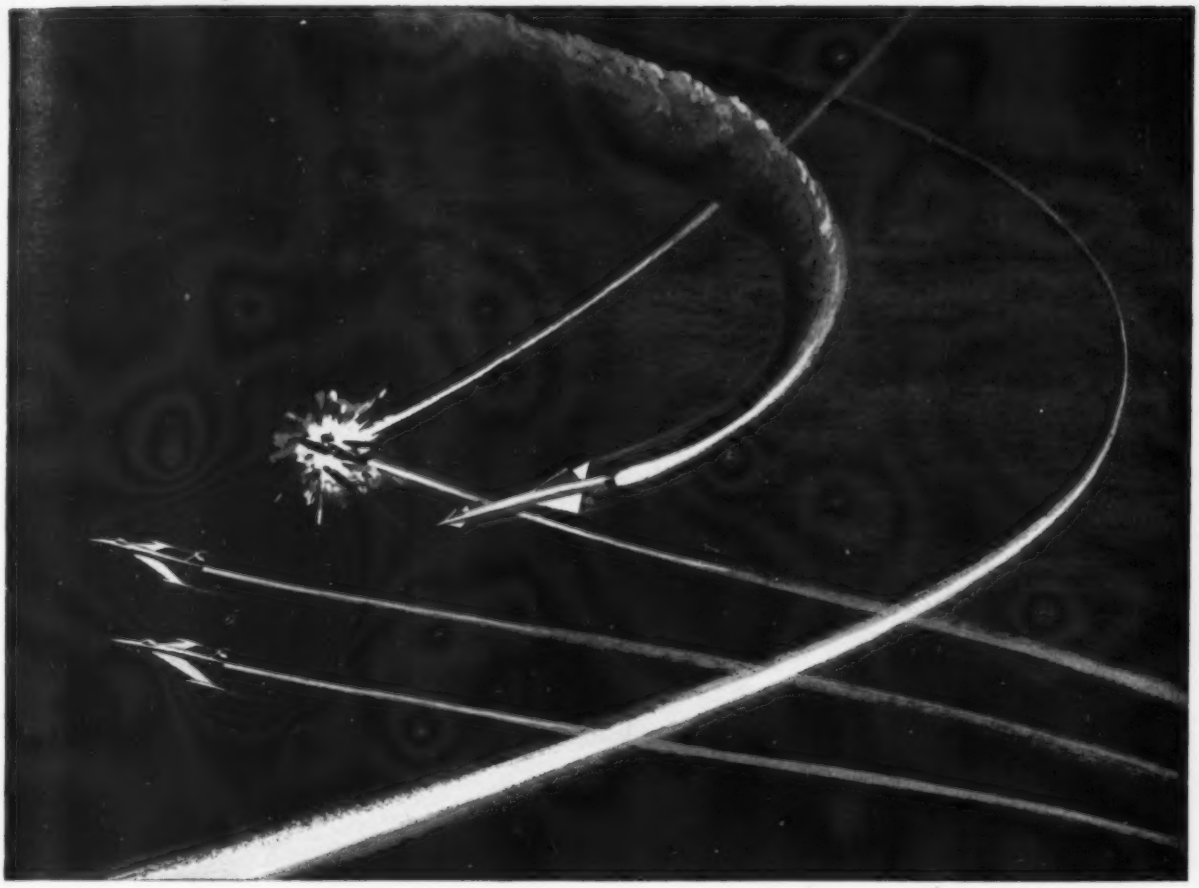
On hand for the evaluation series were flight inspection teams from Pan American World Airways, American Airlines, United Air Lines and KLM Royal Dutch Airlines.

Preceding the airlines tests, a Society of Automotive Engineers' cockpit standardization panel put its stamp of approval on the Boeing arrangement after two flights aboard the 707. Representing SAE were panel chairman M. G. Beard, American; Scott Flower, PAA; W. E. Larned, and C. M. Christenson, United; and M. Blake Cahill, Northwest.

ONE OF FIVE United Air Lines' pilots checked out on the 707 was I. E. Sommermeyer, UAL director-flying.

THREE-MAN FLIGHT ENGINEERING team from American Airlines, shown with Boeing test pilot A. M. "Tex" Johnston (right) include: (L. to R.) W. C. Lawrence, asst. v.p.-chief engineer; W. W. Braznell, director of flight operations; and, Frank Kolk, development engineer.

Today and Tomorrow...



CANADAIR COUNTS — *in Guided Missiles*

Grim herald of the push-button war, the guided missile's development has become an urgent matter for all world powers. The missile itself is not enough . . . the race is now for sharper control, greater speed, higher altitudes, more sensitive response.

In the interests of national security, this program is naturally classified but we can say this much: we are working closely with Canadian government research agencies, in the advanced technological fields of design, development and construction of guided missiles. We have produced missile airframes and control equipment . . . have seen them through actual firing tests.

This is a challenging field, where Canadair engineers face and overcome new problems every day. In missile development, as in other fields of aeronautical achievement, people who know say, "you can count on Canadair."

C-L CANADAIR LIMITED

CANADAIR

— AIRCRAFT MANUFACTURERS —

LIMITED, MONTREAL, CANADA

A subsidiary of GENERAL DYNAMICS CORPORATION, New York, N.Y. — Washington, D.C.

CA58-13U57

Handley Page Aims at U. S. Airline Market

British firm believes 44-passenger Herald is ideal DC-3 replacement for local carriers; operates at less than two cents per passenger-mile.

By ANTHONY VANDYK

• With the U.S. local service airlines as one of its principal targets, Britain's Handley Page company is stepping up its Herald sales campaign. Interest in the high-wing, four-engine "DC-3 replacement" has heightened since the aircraft started its flight test program in August. At last month's Farnborough show the Herald was the subject of particular scrutiny by U.S. airline officials, CAB vice-chairman Joseph P. Adams and CAA technicians (including Henry Weeks, chief of CAA's aircraft engineering division.)

British sources report that orders so far placed for the Herald are worth $15 million. It is known that Australian National Airways has signed up for 20, Lloyd Aereo Colombiano for six, Queensland Airlines for three, and Air Kruise, British independent, for a minimum of six.

All orders booked to date are understood to be provisional pending results of the flight test program. If this proves out the manufacturer's claims, many additional orders are likely to materialize for, on paper, the Herald seems to be just what is required by a lot of operators seeking a DC-3 replacement: a 44-passenger aircraft capable of operating from a 3,000-ft. grass strip, cruising at 200 mph at 50% METO power and with an operating cost of under 2¢ per passenger-mile.

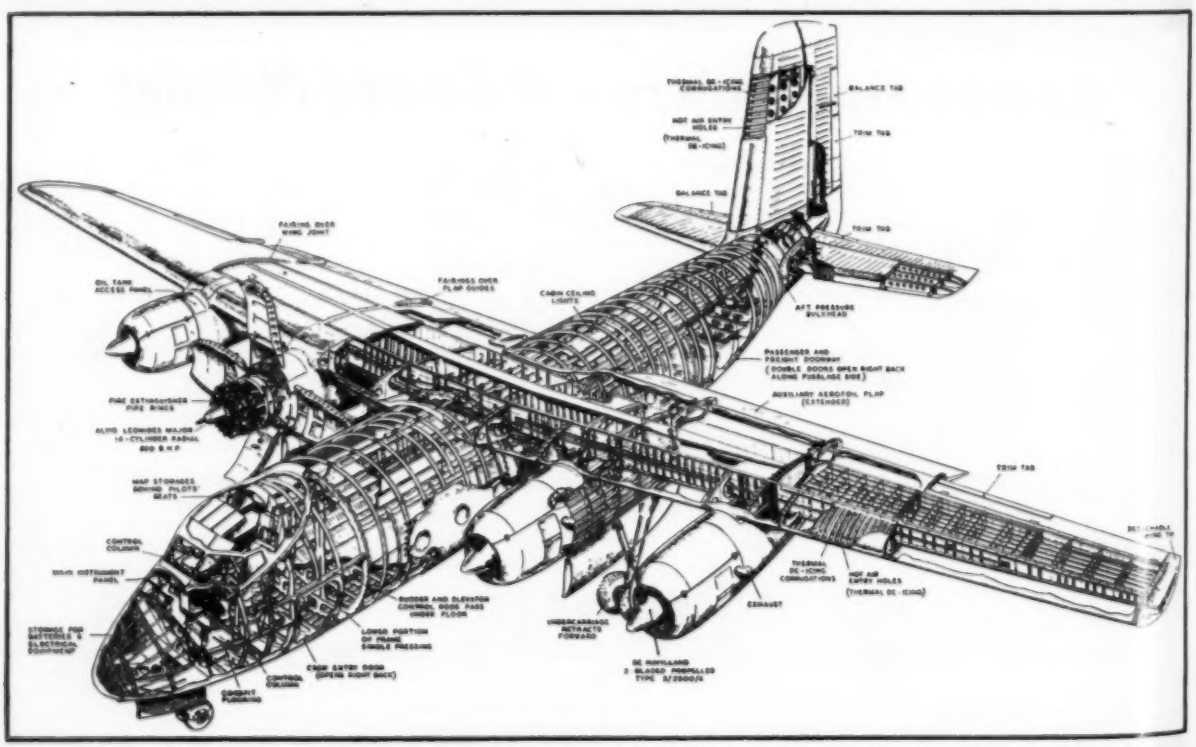
•**Operators will require** some convincing of the validity of Handley Page's claims since the company has produced no commercial transport of repute for many years (the postwar Hermes was "retired" by BOAC after a couple of years' service.) Moreover, the Herald's powerplant, the 870-hp Leonides Major, is made by a firm whose products are little known outside the United Kingdom, Alvis Ltd.

To many operators, a combination of Handley Page and Alvis raises serious questions as to after-sales service and spare parts arrangements. Both companies are fully aware that they are at a potential disadvantage in this respect and thus are making special plans to establish facilities to ensure that the Heralds are kept fully serviceable. In Australia, where the aircraft will probably first see service, a central servicing organization is to be set up by Handley Page.

In order to cater to operators preferring American engines the Herald will be available on demand with 800-hp Wright Cyclone C7s. Nonetheless, Handley Page is basing its sales campaign on the use of the Alvis engine and its seems that the company will seek U. S. certification of the Herald with the British powerplant. Equipped with four Leonides Majors, the Herald has a gross weight both for take-off and landing of 34,000 lbs. Maximum payload, based on minimum fuel, is 10,705 lbs. at which weight range is 348 miles.

•**As a passenger transport** the Herald can be equipped with up to 44 seats while as a freighter it offers 1,575 cubic ft. of cargo space with gangways clear. Easily removable forward and rear bulkheads enable various combination passenger/cargo configurations to be offered.

The loading diagram shows that, if the first 650 lbs. of freight is placed in the rear cargo compartment, the center of gravity will remain within the required range provided freight is then added in the ratio of 2 lbs. in the rear compartment to 1 lb. in the front freight compartment until the latter is filled. With this loading procedure, there is no restriction on the seating of



HERALD continues Handley Page's tradition of simple, robust construction. Designed as a "DC-3 replacement" features ease of maintenance.

New plant for MENASCO

Expanded facilities for meeting the challenge of consistently better LANDING GEAR AND GUIDED MISSILE COMPONENTS

Pictured above is the new $5,000,000 Texas plant of Menasco Manufacturing Company, scheduled for completion early in 1956. Centrally located between Fort Worth and Dallas, about two miles from Amon Carter Field, the initial 100,000 square-foot structure will house 500 employees and a completely integrated manufacturing system for the design and production of aircraft landing gear and guided missile components. The 42-acre site will allow further facility expansion, as required, to meet Menasco's growing production demands. Like Menasco's Burbank, California, facility, the new plant will offer the benefits of the years of aviation experience, the highest engineering skills, and unsurpassed manufacturing techniques that have always characterized Menasco's services to the nation's leading airframe manufacturers.

Specialists in aircraft landing gear

menasco manufacturing company

805 S. SAN FERNANDO BOULEVARD, BURBANK, CALIFORNIA

Circle No. 27 on Reader Service Card.

Aircraft HERALD — AIRCRAFT ROUTE ANALYSIS — Date

Engines Alvis Leonides Majors — Calc. by A.J.L.

Take-off	ΔT 20°C	Sector	New Bern-Morehead City
Destination	ΔT 20°C	Distance	33 st. miles
Mean	ΔT	Alternate	New Bern
Wind speed	See below	Distance	33 st. miles
Cruising method	Destination		50% M.E.T.O.
	Alternate		50% M.E.T.O.
Reserves etc.			See text, page 5

Data References	
Brochure	June, 1954

ITEM	Weight lb.	Height ft.	Ampg. or f. flow	Speed TAS (S.)	Fuel Imp. gal	Time hours	Dist.
a Start, checks, taxi.					12.5		
b_1 Take-off	33,700				6.0	.083	
b_2 Accelerate to climb speed							
c Climb) Still		3,000		121 121	8.7	.034	4.1
d Cruise) air	33,570	3,000	95.6	180 180	6.9	.072	13.0
e Descent to approach)		3,000		133 133	5.8	.083	15.9
f Final circuits & landing							
g Taxy after landing					7.5	.050	
Total a to g.					47.4	.322	33.0
Fuel contingency 1.5 %					.7	102.5 m.p.h.	
TOTAL FUEL FOR STAGE.					48.1	143.5 Imp.g.p.h.	

					I.F.R. Fuel Imp. gal	I.F.R. Dist.	V.F.R. Fuel gal.
Fuel b_1 to g					34.3		
Climb) 26 m.p.h.	33,500	3,000		121 95	8.6	3.2	
Cruise) headwind		3,000	95.6	180 154	3.9	16.0	
Descent to sea level)		3,000		133 173	5.8	13.8	
Cruising 60 mins.					25.6		
Stand off 30 mins.							
Total					154.8	33.0	
Fuel contingency 5.0 %					7.7		
(1) TOTAL FUEL FOR PAYLOAD ASSESSMENT					162.5		
Fuel load at 7.2 lb. per gallon.					1170		

SEVERAL U. S. LOCAL SERVICE AIRLINES have been provided with Herald route analyses. The page above is reproduced from one supplied to Piedmont Airlines whose president, T. H. Davis, has made laudatory remarks about the aircraft.

passengers in the cabin; they may sit where they wish.

Structurally the Herald is interesting in many respects. In the center section of the wing there are no heavy spar booms which normally are susceptible to fatigue; the skin carries bending and end loads. The center section, which carries all four engines, is of sandwich construction, having double skinning separated by metal corrugation. This type of construction reduces the number of ribs required in the wing. Normally stressed-skin construction is used for the fuselage and outer wings.

A 3,000 lbs./sq. in. hydraulic system is used for operating the tricycle landing gear, flaps, nosewheel steering and brakes. The cabin is pressurized with a maximum differential of 3.35 lbs./sq. in., which is equivalent to a cabin altitude of 6,500 ft. when the aircraft is flying at 15,000 ft. Air-conditioning equipment supplies at least 50 lbs. of fresh air per minute at 15,000 ft. The cabin temperature is maintained between 15 and 21°C. Incoming air may be heated by heat-exchangers fitted to the outer engines.

•**Technically, the Herald** is modern yet lacking in frills. Economically it should be a money-maker. The price—between $350,000 and $400,000—may seem high but it compares favorably with other "DC-3 replacements."

Furthermore, because most Herald customers are likely to be "small timers" with very limited financial resources, Handley Page is offering special credit arrangements in conjunction with Air Finance Ltd., British aircraft export financing organization. A 10% payment is needed on placing the order. Prior to delivery, a further 40% must be paid with another 10% due on delivery. The remaining 40% may be paid later under arrangements aimed to meet the customer's requirements as far as possible.

The Herald is no paper aircraft. The first prototype is flying and the second should be in the air by early 1956. The first production Herald is scheduled to fly in mid-1957 with ten aircraft due to be completed by the end of the year. Thus, Handley Page seems to have good reason to believe that it has in the Herald a product which will restore the company to its former position of a major producer of commercial transports. • • •

CAB NEWS

Recent Decisions

Lake Central Airlines ordered to show cause why 17 points on its local service system should not be made permanent and 8 others renewed for three years.

American Airlines' "deferred freight" tariff, naming reduced rates for certain transcontinental shipments, rejected by CAB for violation of the minimum rate order.

Slick Airways granted exemption to provide air-truck service to Nashville, Tenn., and Pocatello, Ida.; also authorized to render scheduled freight service to Oklahoma City and Wichita.

U. S. international and foreign lines are given until Oct. 27 to file comments with CAB on proposed regulation authorizing reduced fares for overseas-based military personnel traveling on furlough.

CAB Calendar

Oct. 12—Argument, Northeast-Southwest Service Case. Wash., D. C. Docket 2355 et al.

Oct. 18—Hearing, Peoria-Ft. Dodge Case (Ozark Air Lines). Tentative. Docket 7301.

Oct. 24—Hearing, North Central-Lake Central Acquisition Case. Wash., D. C. Docket 5770 et al.

Nov. 1—Hearing, International Service Mail Rate Case. Tentative. Docket 6630 et al.

Nov. 30—Hearing, Foreign Air Carrier Charter Service Investigation. Wash., D. C. Docket 7173.

Pending Cases

CAB reportedly has made its decision in **Denver Service Case** and issuance now is held up pending completion of a written opinion. Expected release date is "about November 1."

Also slated for speedy handling is the **Northeast-Southwest Service Case** in which the oral argument has been advanced one week to October 12, and which, in view of one Board Member's required presence in India on October 16, probably will be decided shortly after oral argument. Opinion writing will then take another four-six weeks.

A conference was held earlier this month in the new **TWA Cincinnati-Detroit Route Transfer Case,** in which TWA voluntarily has agreed to transfer the route on the strength of its award in the New York-Chicago Case of east-west rights at Detroit. Delta Air Lines has applied for the Cincinnati-Detroit segment.

CAB Applications

Northwest Airlines applied for authority to operate between Anchorage and Fairbanks, Alaska.

City and Chamber of Commerce of Fort Worth, Texas petitioned for investigation for "improved air service" at Amon Carter Field; opposed by Dallas, Delta Air Lines and Braniff Airways.

Frontier Airlines applied for certificate to operate between Silver City, N. Mex. and Alburquerque.

Business Trips Account for 60% Of Outgoing Traffic in New York Area

Sixty per cent of the 240,000 passengers who depart annually from La Guardia, Idlewild and Newark Airports are on business missions and 87% of this group go first class, the Port of New York Authority estimates.

The PNYA has released results of a three-week survey made to determine the character of the metropolitan area's air passenger traffic.

The analysis shows that vacationers total about one-fourth of all the air travelers departing from the three airports and of this group 62% go first class.

• **Annual income** has an overwhelming influence on the amount and type of travel, the survey reveals. One-half of the passengers listed family incomes in excess of $10,000, with more than four-fifths of this group buying first-class tickets.

"The difference between family incomes reported on the survey and for the U. S. as a whole is striking," the analysis notes. "The half of the passengers reporting family incomes over $10,000 contrasts with 5% of the population generally. About four-fifths of the population have incomes below $6,000 while only 18% of the respondents reported incomes in these groups."

"The average number of trips made in the last 12 months is far greater for passengers with higher family incomes," the report states. "This ranges from the low average of four trips per year for those whose family income is under $3,000 to a high of about 36 trips per year for those with family incomes in excess of $20,000 per year."

It is pointed out, however, that the averages cannot be interpreted as relating to air travel by the general population because persons who made no trips during the survey period had no possibility of being questioned.

• **The following tabulation** shows the number of trips per year for passengers in each income group, excluding transfer passengers:

Family Income	Number of Passengers	Av. No. of Trips in Past 12 Months
Total	194,100	19.4
Under $3,000	7,700	3.9
$3,000-$5,999	27,900	6.6
$6,000-$9,999	43,300	14.8
$10,000-$19,999	55,800	22.8
$20,000 and Over	40,300	35.8
Unknown Income	19,100	10.0

Occupation of the air passenger also is a major factor in the amount and type of airline travel (See box). The largest group, accounting for 30% of the total, was found to be in the professional-technical category, with 80% of these on business trips. The manager-official category was second, representing 28% of the passengers, with 85% on business.

While the salesmen category is a low third in rank, the report found it represented about 9% of the total traffic, showing the highest average number of trips (36) during the 12-month period. It was further ascertained that the secretary-clerk group "accounted for a fair share (5%" of all the passengers, but the average number of trips (6) is "low when comparde with other groups." Housewives, accounting for "a large portion (12%) of total travel" were almost entirely on trips for personal reasons.

The analysis further found that nearly 75% of the 194,100 (excluding transfer) passengers traveling domestically were men, who in turn accounted for 78% of all first-class ticket holders. It was ascertained that the "proportion of coach travel by women was considerably larger, although in actual numbers, more women traveled on first-class tickets."

• **In determining frequency** of travel in a 12-month period, the survey questionnaire requested passengers to count round trips as two. Analysis of the response noted: "It is quite apparent that most of the trips reported were made by a very small percentage of the travelers. Passengers making 150 trips or more in the 12 months preceding the survey accounted for 10% of all trips reported, while the group itself amounted to only 1% of all the passengers. Similarly, 12% of all the passengers accounted for half (49%) of all the trips reported taken during the last 12 months. The passengers in this group averaged 50 or more trips per year."

The survey on which the PNYA analysis is based was conducted during a three-week period last September in cooperation with 13 scheduled domestic airlines serving the metropolitan area. About 8,000 air passengers leaving the three terminal airports were asked by the flight attendants to fill out the questionnaires.

The survey data, the Port Authority states, will be used to help in traffic forecasting, in planning terminal and ground transportation for future needs and in determining whether flight schedules at the airports are convenient for nearby residents. • • •

Relationship of Air Passengers by Occupation To U. S. Working Population

Occupation and Purpose	Percent of Passengers	Number of Passengers	U. S. Working Population (Thousands) -1950-	Passengers Per 10,000 Population	Average Number of Trips in Past 12 Months
Total	100%	194,100*	56,239	35	19.4
Professional, Technical:	30	58,000	4,910	118	21.4
Business	24	45,600		93	
Personal	6	12,400		25	
Manager, Official:	28	53,600	5,018	107	28.0
Business	24	46,000		92	
Personal	4	7,600		15	
Salesman:	9	17,700	3,927	45	36.0
Business	8	14,800		38	
Personal	1	2,900		7	
Secretary, Clerk:	5	9,700	6,895	14	5.6
Business	1	1,000		1	
Personal	4	8,700		13	
Mechanic, Craftsman and Factory Worker	2	4,500	18,923	2	5.8
Other and Unknown Occupation	3	6,200	16,253	4	13.1
Housewife	12	23,700			4.4
Student	5	9,700			4.4
Armed Forces	5	8,700			8.4
Retired	1	2,300			(7.0)

** Excludes transfer passengers.*
( ) Measure probably accurate but based on too few cases to assure that it is within the prescribed range of reliability

Airline Commentary

By Eric Bramley

One of air transport's biggest headaches still is baggage delivery. Worthy of special note, therefore, is United Air Lines' statement that it has reduced plane-to-passenger bag delivery time to a systemwide average of seven minutes. Also, 50% of all DC-7 riders are getting their bags in five and one-half minutes or less. "Commando" baggage teams, self-service counters and new jeep carryalls are among developments contributing to the record. A major accomplishment.

• •

We attended the recent opening of West Side Airlines Terminal in New York. A very fine building indeed; convenient Manhattan departure point for Newark Airport. One thing bothered us, however: Suppose an incoming passenger wants to get from Newark to LaGuardia or Idlewild? At this writing, it looks like he'll take a bus to West Side, a taxi to East Side Airlines Terminal, and another bus to the airport—unless, of course, he rides New York Airways' very fine helicopter service. Anyway, airlines would do well to work out a better ground transport system.

• •

Most amusing airline ad in some time is Qantas Empire Airways' full-pager in *New Yorker*. Space doesn't permit extensive quotes, but the ad's headed "Win a New 1955 Kangaroo." The Australian line is seeking a name for its Super Connies; fill in the coupon, grand prize is a kangaroo. "Second prize is a stuffed Koala bear, and if you take our advice it's the prize to shoot for; forget the kangaroo. You always knew where you stand with a stuffed Koala bear." Third through 28th prizes are "Qantas old school ties . . . extremely attractive and have a lot of snob value."

Twenty-ninth through 100th awards are boomerangs, "complete with instructions for oiling." All entrants receive an explanation ("suitable for framing") of why there is no U in Qantas. "In case of ties, duplicate kangaroos will be given. The decision of the kangaroos is final." It's a real eye-catcher.

• •

Odds and ends: . . . TWA now using ads in New York subways, plugging tourist service . . . American Airlines just hired a new stewardess named Merry Melody . . . Elmer Thompson, Air Transport Association's well-known information director, fell in his office, broke his hip, will be in Garfield Hospital, Washington, for two months . . .

Smith Explains AA's No-Show Policy

American Airlines does not believe that domestic airlines should have dropped the no-show penalty for air coach passengers and only agreed to its elimination because of the "pressure of competitive forces, acting, in our opinion, against the public welfare," C. R. Smith, AA president, told the Civil Aeronautics Board.

Airlines decided by majority vote through the Air Traffic Conference that the penalty would no longer be mandatory after Oct. 15 (AMERICAN AVIATION, Sept. 26).

"A penalty system . . . is an essential element of the public service the airlines are expected to provide . . . It is our belief that continuing abuse of the reservations system by the public is primarily the fault and responsibility of the airlines and not . . . of the public, for the existing system, which permits, and at least indirectly encourages, abuse of the reservations system, is one devised by the air carriers and continued with their approval," Smith said in a letter to CAB.

"We believe that the penalty system for air coach . . . should not be rescinded; rather, that a comparable system should now be extended to first-class . . ." Explaining why AA hasn't started its own system, he stated: "Experience clearly indicates that no single carrier or minority group of carriers can effectively operate a system designed to discourage abuse of the reservations system if all other carriers refuse to do so."

All But Two Lines Switch Family Days

All but two domestic airlines have switched family plan days from Monday-Tuesday-Wednesday to Tuesday-Wednesday-Thursday, effective on various dates in the first half of October.

Two exceptions are American Airlines and Mohawk Airlines, which have altered their plans to cover the period from noon Monday to noon Thursday. Other airlines' plan runs from midnight Monday to midnight Thursday.

C. R. Speers, AA's senior vice president-sales, said the plan was being extended to give it more "flexibility." Before the Monday-Tuesday-Wednesday plan was first effected in 1948, AA's heaviest traffic days were Friday, Sunday and Saturday, in that order. Shortly after inauguration of family fares, Wednesday, Monday and Friday became peak days, with Tuesday ranking fourth.

United Air Lines said its change to Tuesday-Wednesday-Thursday "reflects a shift in travel trends since the . . . plan was adopted." The switch will enable UAL to carry out the original objectives of the plan which are to stimulate mid-week travel and thus level out peaks and valleys, it said.

Sales, Traffic, Promotion

Closed-circuit television for dissemination of flight information is being tested at Portland by **United Air Lines.** A TV camera is focused on the flight information board in the dispatch office; two receivers are located in the lobby for the public, others in telephone sales and ramp chief's offices. System will be extended to other stations if tests are successful . . .

American Airlines' plan to boost its freight tonnage through a "deferred airfreight" service was rejected by Civil Aeronautics Board. AA's proposal was to offer a transcontinental service at sharply reduced rates (10c to 12c a ton-mile) for volume shipments which would not be released to consignees until a designated time. Purpose was to provide faster service than surface competition at comparable rates, while at the same time minimizing diversion from existing air freight traffic. **CAB** said the plan violates its minimum freight rate order . . .

Continental Air Lines has formed a Flight-a-Month Club, open to travelers who average 12 or more air trips annually (not necessarily on **CAL**). Members will receive small identification labels, about the size of a nickel, which are to be attached to **CAL** credit cards and/or air travel plan cards, enabling **CAL** to give personal recognition to regular customers . . .

New **TWA** 57-frame filmstrip, "Aviation and World Understanding," is now available without charge to schools and aviation education groups. A teacher's manual containing the filmstrip commentary and suggestions on its use accompanies the unit. Produced and distributed by Audio-Visual School Service, 48 E. 29th St., New York 16, N. Y., filmstrip can be kept as a permanent part of the school's film library, **TWA** says . . .

NOW

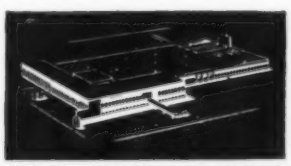
MORE PNEUMATICS FROM STRATOS

Stratos has acquired the Rhodes-Lewis Co., a subsidiary of McCulloch Motors. Rhodes-Lewis engineering, manufacturing and sales now are being incorporated into the Stratos organization.

Rhodes-Lewis products are being integrated into Stratos' line of pneumatic systems and equipment for aircraft. During the transition period close cooperation between Rhodes-Lewis and Stratos assures continuous production and uninterrupted delivery of Rhodes-Lewis equipment.

Concurrent with the acquisition of Rhodes-Lewis, Stratos is establishing a western factory. This will make Stratos' manufacturing facilities convenient to major aeronautical centers on both coasts.

Western Branch: 1800 Rosecrans Ave., Manhattan Beach, Calif.



Main Plant: Bay Shore, Long Island, New York

Stratos products include:
Air-conditioning and pressurization systems • Turbo Drives • Controls and Valves • High Pressure Pneumatics

Rhodes-Lewis products include:
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CAB Actions Hint Less Protection, More Opportunity for Local Lines

That the local service airline industry has "come of age" was emphasized by two recent Civil Aeronautics Board developments in which:

• Southwest Airways' "protection" against trunkline competition by United Air Lines at three California points was eliminated as SWA received the first local permanent certificate.

• Various trunk-line applications for nonstop Syracuse-New York City rights were deferred in the New York-Chicago decision as CAB took favorable notice of a pending Mohawk Airlines' application to provide the 200-mile nonstop service.

The Southwest Case was unique in many respects. Last year it was labeled by one CAB Member as the first step toward elimination of the local service industry. That conclusion stemmed from a government policy report suggesting a gradual phasing out of "high-subsidy" local lines. CAB appeared to go along with the policy by including in the SWA renewal case a United application for SWA's routes.

In the decision issued late last month, thanks to permanency legislation enacted this year by Congress, the tables were reversed as Southwest became the first of the local industry to be issued a permanent certificate for 17 of its west coast cities. Seven other points were renewed for a three-year period.

But a highly significant point in the decision was that lifting the suspension on United's service to Monterey, Santa Barbara and Eureka, which had been imposed years ago to protect SWA.

• **Explaining its action,** the Board majority, with which Vice Chairman Joseph P. Adams disagreed, said: "The enactment of permanency legislation may be taken as reflecting a legislative finding that the local service air carriers are generally past the experimental stage and are to be recognized as an established part of our national air transportation system.

"From this it follows that certain Board actions which were warranted during the earlier phases of local service carrier evolution may require re-examination to determine whether they are appropriate when the local service carrier's survival is assured.

"While suspensions of pre-existing trunkline certification at points served by local carriers may well still be required for various reasons in particular cases, such suspensions as are before us now represented at least in part promotional devices to assist the local service carriers in establishing themselves, and were avowedly temporary in nature."

• **Adams, however,** said the suspension lifting was contrary to the recommendations of the Examiner and Bureau Counsel "who found that UAL's reinstatement would increase Southwest's mail pay need by some $300,000 per year with no corresponding benefit to United's financial condition."

He argued that permanency legislation "should have absolutely no adverse effect on this Board's ability to properly promote and develop local air carriers."

As another unique point in the case, a long-standing investigation into a possible merger of Southwest and Bonanza Air Lines was dropped because there is "no indication that the carriers would agree upon an integration."

• **The Syracuse-New York** situation involving Mohawk, meanwhile, appears to point up the marked change in industry thinking which, until now, has seen violent trunkline opposition to even the thought that a local carrier may "metamorphose" into a trunk through grant of a 200-mile nonstop between two major cities.

CAB itself has always appeared to guard against route grants which might lift a local line out of the feeder-type category. But while the possible grant of the Syracuse-New York nonstop to Mohawk does not in itself accomplish that transformation, it is a strong indication of the technological changes which have made 200-mile routes appear small.

• **Significantly,** Mohawk's Syracuse-New York route was not in the New York-Chicago Case, although the Board's decision in that case ordered expedited hearings on the application.

The order was quickly followed up with a notice from Chief Examiner Francis W. Brown calling for a pre-hearing conference on October 4. To date, Board officials indicate a minimum of trunkline opposition.

Mohawk doesn't have the nonstop route yet, but this language taken from the New York-Chicago decision augurs well for its chances:

"Mohawk already provides air service between Syracuse and New York and it is posible that a nonstop authorization to Mohawk would fully meet the needs for competitive Syracuse-New York service and at the same time result in substantial subsidy savings to the Government."

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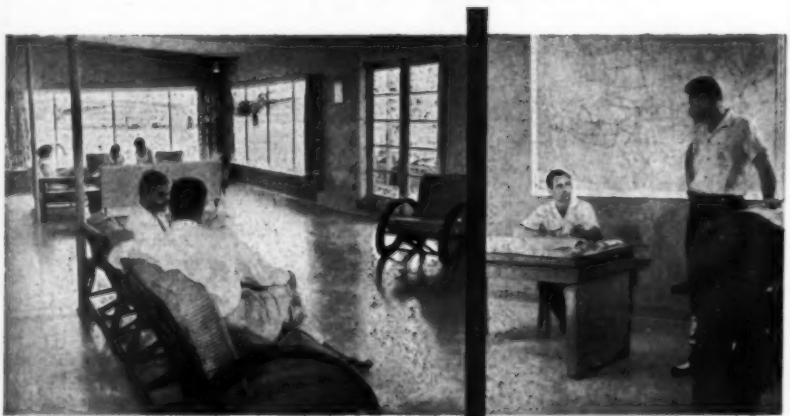

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*D	900	650	50-52	3	Super-92
*E	900	680	50	2	Super-92
*F	871	690	50.5	1	Super-92
*G	860	675	50	2-3	Super-92
*H	740	600	48	2	Super-92
*I	670	660	52.5	1-2	Super-92

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Airlines Report Top Executives Salaries

The following carriers have filed with CAB Schedule E reports listing the 1954 salaries, other compensation, and stockholdings of officers and directors:

• **Capital Airlines, Inc.**—J. H. Carmichael, pres. and dir., $52,800 salary (up $4,800); R. G. Lochiel, v.p., treas. and dir., $33,000 salary (up $3,000); James W. Austin, v.p., $30,800 salary (up $2,800); James B. Franklin, v.p., $28,600 salary (up $2,600); Robert J. Wilson, v.p., $24,475 salary (up $2,225); Hayes Dever, secy., $19,250 salary (up $1,750); Charles H. Murchison, chrm. exec. comm. and dir., $36,300 salary (up $18,300).

• **Delta Air Lines, Inc.**—C. E. Woolman, pres., gen. mgr. and dir., $48,000 salary (up $6,000); Laigh C. Parker, v.p. traffic and sales and dir., $25,000 salary (up $1,333.28); Charles H. Dolson, v.p. operations, $24,000 salary (up $1,333.36); Todd G. Cole, v.p. finance and asst. secy., $18,666.68 salary (up $2,666.68); R. S. Maurer, v.p. legal and dir., $17,333.36 salary (up $6,666.72); W. T. Beebe, v.p. personnel, $15,800 salary (entered office April, 1954); Erle Cocke, Jr., v.p. state rel., $15,800 salary (entered office October, 1954); T. M. Miller, asst. v.p. traffic and sales, $15,800 salary (up $5,800); W. T. Arthur, asst. v.p. operations, $19,500 salary (up $6,500); Carl H. McHenry, secy. and dir., $1,200 salary; Travis Oliver, treas. and dir., $1,200 salary; Catherine FitzGerald, asst. treas., $5,700 salary (down $25.00); R. W. Freeman, chrm. of bd. and dir., $241.76 salary (up $241.76); Carleton Putnam, dir., $7,993.69 salary (down $1,172.97).

• **Pan American-Grace Airways, Inc.**—Andrew B. Shea, pres. and dir., no salary, no bonus and indirect compensation; Erwin Balluder, v.p. and dir., no salary, no bonus and indir.; Douglas Campbell, v.p. and gen. mgr., $24,000 salary, $7,000 bonus and indir.; T. J. Kirkland, v.p., $21,000 salary, $4,000 bonus and indir.; K. A. Lawder, v.p. and comptroller, $21,000 salary (up $2,500), $5,000 bonus and indir.; E. G. Bern, v.p., $18,000 salary (up $250), $3,000 bonus and indir.; C. S. Collins, asst. v.p., $12,000 salary (up $1,716.66), $1,200 bonus and indir.; W. F. Cogswell, secy., no salary, no bonus and indir.; J. S. Woodbridge, treas., no salary, no bonus and indir.; H. Preston Morris, asst. secy., no salary, no bonus and indir.; A. J. Phelan, asst. comptroller, $12,000 salary (up $1,000), $1,200 bonus and indir.; W. F. Lewis, asst. treas., $11,000 salary, $775 bonus and indir.; E. E. Spencer, asst. treas., $10,500 salary (up $312.50), $775 bonus and indir.

• **Trans World Airlines, Inc.**—R. S. Damon, pres. and dir., $84,999.96 salary, $900 directors fee (up $100), $28,695.22 bonus and indirect compensation; Warren Lee Pierson, chrm. of bd. and dir., $73,124.92 salary (down $1,875.00), $800 dir. fee (up $200), $35,874.19 bonus and indir.; J. A. Collings, exec. v.p. and dir., $48,000 salary, $700 dir. fee, $26,745.40 bonus and indir.; E. O. Cocke, v. p. sales and dir., $33,000 salary (up $1,625), $700 dir. fee, $18,327.54 bonus and indir.; A. V. Leslie, v. p. finance, treas. and dir., $33,000 salary (up $24,625), $800 dir. fee (up $200), $7,349.27 bonus and indir.; G. L. Gilmore, v.p. public relations, $18,000 salary (up $541.71), $5,582.56 bonus and indir.; D. W. Harris, v.p. industrial relations, $19,999.92 salary (up $812.50), $5,847.26 bonus and indir.; G. H. Clay, v.p. and secy., $22,000 salary (up $1,083.35), $9,571.01 bonus and indir.; M. J. Plodinec, controller, $22,000 salary (up $1,452.85), $6,021.28 bonus and indir.; T. K. Taylor, v.p., $22,000 salary (up $1,083.35), $6,101.45 bonus and indir.; J. L. Weller, v.p. and asst. secy., $19,999.92 salary (up $1,625), $5,846.79 bonus and indir.

• **United Air Lines, Inc.**—W. A. Patterson, pres. and dir., $100,000 salary, $11,218.20 bonus and indirect compensation; R. E. Johnson, vp, asst. to pres. and dir., $40,000 salary (up $10,000), $4,524.08 bonus and indir.; J. A. Herlihy, vp eng. and maint. and dir., $44,000 salary (up $1,000), $4,116.59 bonus and indir.; D. F. Magarrell, vp transportation services, $41,000 salary (up $1,000), $3,903.37 bonus and indir.; O. E. Kline, vp. coordinator of operations and dir., $45,000 salary, $3,244.29 bonus and indir.; D. R. Petty, vp flight operations, $37,000 salary (up $2,000), $3,171.59 bonus and indir.; Curtis Barkes, vp finance and property, $28,667 salary (up $3,667), $2,461.61 bonus and indir.; R. F. Ahrens, vp personnel, $27,000 salary (up $2,000), $2,640.90 bonus and indir.; H. E. Nourse, vp economic controls, $26,000 salary (up $1,000), $3,773.45 bonus and indir.; R. W. Ireland, vp traffic admin., $26,000 salary (up $1,625), $4,032.35 bonus and indir.; S. P. Martin, secy. of corp. and asst. to pres., $15,500 salary (up $500), $1,341.23 bonus and indir.; R. E. Bruno, comptroller, $16,000 salary (up $1,350), $837.73 bonus and indir.; A. M. deVoursney, treas. and asst. secy., $16,000 salary (up $1,000), $994.33 bonus and indir.

EN ROUTE . . .

WAYNE W. PARRISH

A Special Bidet for A Special Columnist

That bit of French plumbing called the **bidet** about which I wrote in detail several years ago, keeps popping up in my life every so often. And of all places—Denver.

I had arrived on a Continental Convair during the evening and took a cab over to the new Skyways Hotel, two minutes from the terminal, where I had a reservation. I thought the night manager gave me an unusually enthusiastic welcome when I gave my name but thought no more about it.

I followed the bellhop to my room. He turned on the lights, put down my bag, and then noticed a piece of plumbing in the bedroom. Obviously baffled, he made a quick dash to the bathroom to see if repairs were going on, then returned to look at the object in the bedroom corner.

By that time I was laughing and reading the sign posted nearby, and explained that this was a gag thought up by some local rascals and that the object of his unbelieving eyes was a **bidet**. He had never seen or heard of one. So I patiently explained what it was for and by the end of my lecture he allowed as how it was a pretty dadgummed smart piece of merchandise.

Next morning I found out from Stu Faulkner that he and Jack Smith, both guys being with Continental Air Lines, had scoured Denver for a **bidet** for my arrival. They finally located a nice powder blue job made by Crane but it took considerable persuasion to get the distributor to let it go for the night. It had no fixtures attached but it served its purpose as a gag.

At least it was a guaranteed way of getting the Skyways Hotel mentioned on this page as one of numerous good hotels and motels now available on or near airports. This one rates well. I had the best sleep in three weeks. The rooms are large, the bathroom attractive with plenty of space for toilet articles, and a whole new section of rooms complete with fine dining room is to be added shortly. Address: 3855 Quebec Street, Denver 7, within sight of the airport to the northwest.

Speaker Sizzles

Denver was an overnight stop from Washington to Los Angeles which took me by East St. Louis for a commencement address at Parks Air College of St. Louis University. It was one of those very hot, sticky, humid days and the ceremonies were in a gymnasium where the temperature must have been about 120. To top it off, I had to put on a mortarboard cap and wear an academic gown which had a velvet collar, plus a hood arrangement to show what school I had attended. I guess the speech was okay. I wouldn't know, it was so hot. The sweat poured out and my shirt was wringing wet.

Over in St. Louis I visited McDonnell Aircraft and had lunch with J. S. McDonnell, the president, and Bob Wood, former editor of Aviation Week who is director of public relations out there and getting along just fine. On

Oh, No!

the way out from Washington I finally hit Owensboro, Ky., on Eastern, a new airport stop. From St. Louis to Kansas City I took a TWA Martin 404 and then switched to a Continental DC-3 to hit two new stops at Manhattan—Fort Riley, and Salina, both in Kansas. But it was so hot that Les Bowen, station mgr. at K.C. arranged for me to switch to the Convair at Hutchinson and so I missed stopping at Great Bend, only remaining airport to hit in Kansas.

Thanks, Continental, for the welcomes at Topeka (that's a fine new airport terminal there) and Salina. At Kansas City I ran into Capt. Ed Campbell, whom I first met when he was flying trimotored Fords for the old Grand Canyon Airways back about 1936. At Hutchinson I discovered that the station manager is Charles Brooks, brother of Howard Brooks who handles Pan American's airmail problems out of New York. The new Hutchinson terminal is well laid out, very attractive.

Had a fine United DC-6B flight from Denver to San Francisco and discovered that M. W. Lowe, flight engineer, is a fan of this page. And on the American DC-7 back to Washington J. H. Garrett, also flight engineer, came back to tell me he's a fan. What is this attraction for flight engineers?

Out in Los Angeles I gave a speech to the big Lockheed Management Club in the Statler Hotel ballroom. Terry Drinkwater, president of Western Air Lines, introduced me. It was a swell and attentive crowd. Larry Dillin is this year's president and Derk McCardy is the program director. The club is sc big—3000 members—that it has a full-time manager in the person of Don Tuttle. I felt quite honored to be invited.

Customer Always Wrong

I should have written about Florida long before this because I owe some thanks to Jim Tilford, National's manager at West Palm Beach, who waited up late one night (one of those "most rare" late arrivals, you understand) and fixed me and my wife up with a room at the Colonnades, a fine new hotel right on the beach at Palm Beach Shores adjacent to Riviera Beach. The coffee shop is very noisy but a little soundproofing could help that; otherwise it's a place to know about.

As for the town of Riviera, adjoining West Palm Beach on the north, I found a restaurant owner who believes the customer is always wrong. The place is Soret's, nice-appearing and modern, at 2535 Broadway on U.S. #1 Highway. My wife and I ordered "airline steaks" and found we couldn't possibly eat them. Quite apart from the fact that Soret's libels the airlines by the "steak" labels, I didn't think we should pay for the stuff. Never in any eating place in the world, at any time, have I ever received such a discourteous, crude, bawling out, ordering me to pay even though we couldn't stomach the so-called steaks. Soret's is off my books for good and brother Tilford, I hope you kill that "airline" label on what is whimsically called "steak." What a place!

I owe a special thanks to those energetic Smalley Brothers, Bob and Earle, who own Couture Car Rentals in Miami and Miami Beach. Having a truck come around to the hotels to wash their rental cars and fill 'em up with gas is my idea of good service.

Plenty of Pream

Some issues back I commented on how difficult it was to open a packet of Pream, the cream substitute being used by some airlines. That brought me a nice letter from Lee Baker of the sales department of M & R Dietetic Laboratories of Columbus, O., advising me that the company was aware of the difficulty and was just then introducing a packet with a notch for easier opening. He also sent me a box of fifty Freams. Thanks on both counts, Brother Baker.

Also some issues back I commented on the way passengers mess up the washrooms on long flights, and suggesting the airlines ought to use more signs asking cooperation. Herb Milley of PAA's Pacific-Alaska Division passes on word that PAA in the Pacific has put in small signs which read "You may use your towel to clean the wash basin," and that the lavatories are now practically 100% cleaner. Passengers have accepted the suggestion very well.

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It's Performance that Counts!

For many years, Phillips *66* aviation gasolines have been top performers in planes flying in commercial and military service. Today, Phillips Petroleum Company produces tremendous quantities of 115/145 grade aviation gasoline, and also furnishes the most modern fuels for the latest designs in turbo-props and jets.

During World War II, Phillips was first to manufacture Di-isopropyl and HF Alkylate, two power-packed aviation fuel components of utmost importance to modern high-speed performance.

In aircraft fuels it's *performance* that counts. And Phillips *66* products are *outstanding* for performance!

AVIATION DIVISION
PHILLIPS PETROLEUM COMPANY
BARTLESVILLE, OKLAHOMA

In the late 1920's, the U. S. Navy carried out its first successful experiments in launching "parasite" planes from a "mother" airship, when fighters were successfully launched and retrieved by the big dirigible *Los Angeles* in flight.

Today, the U. S. Air Force has an operational *Flying Aircraft Carrier*—the giant GRB-36 intercontinental bomber which can launch and recover a "parasite" jet fighter at high altitudes.

The long range of the GRB-36 bomber, combined with the speed and firepower of the F-84F fighter bomber, adds a potent weapon to U. S. Strategic Air Power.

Phillips 66

AVIATION PRODUCTS

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